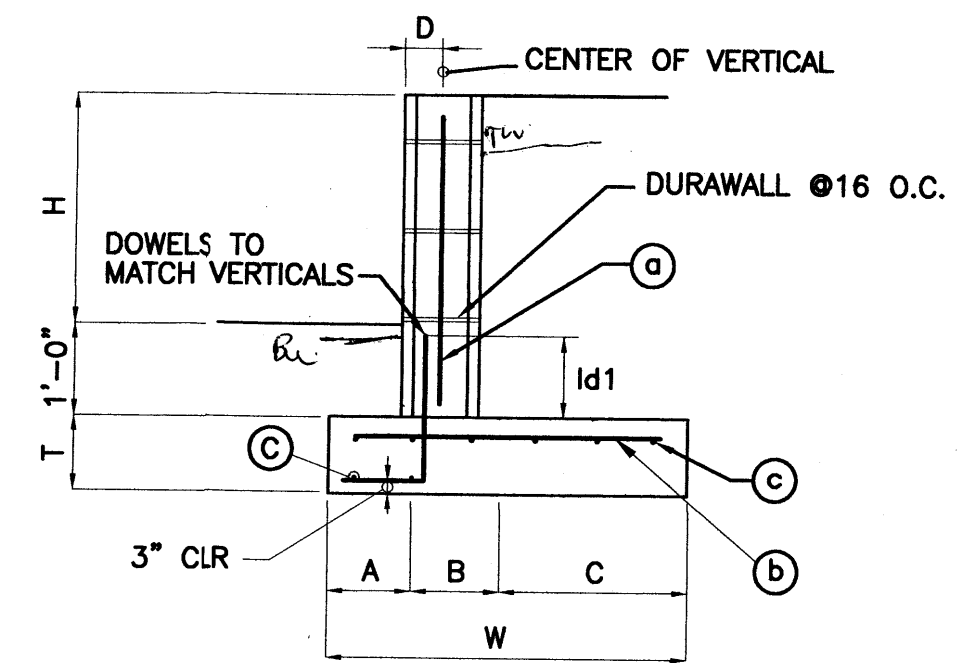
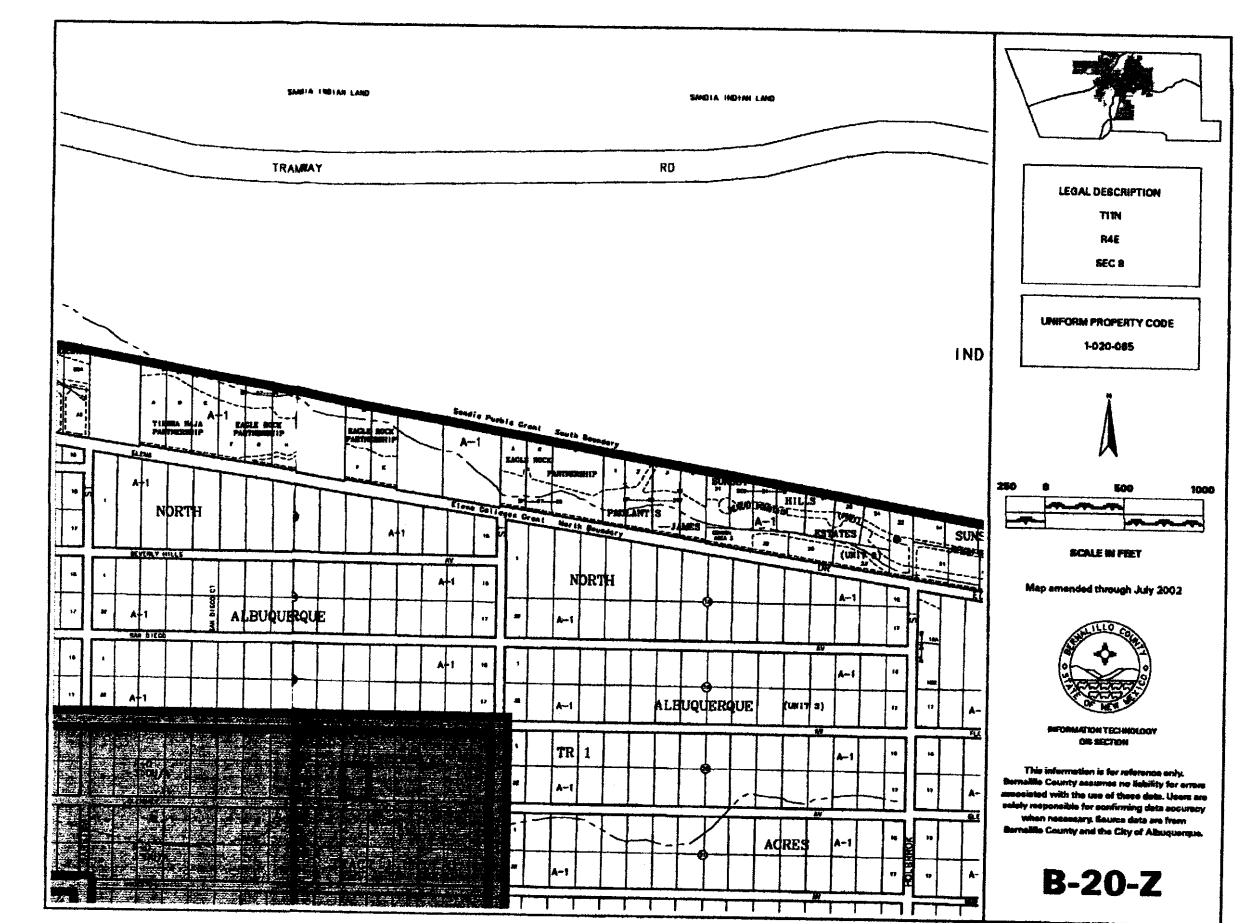
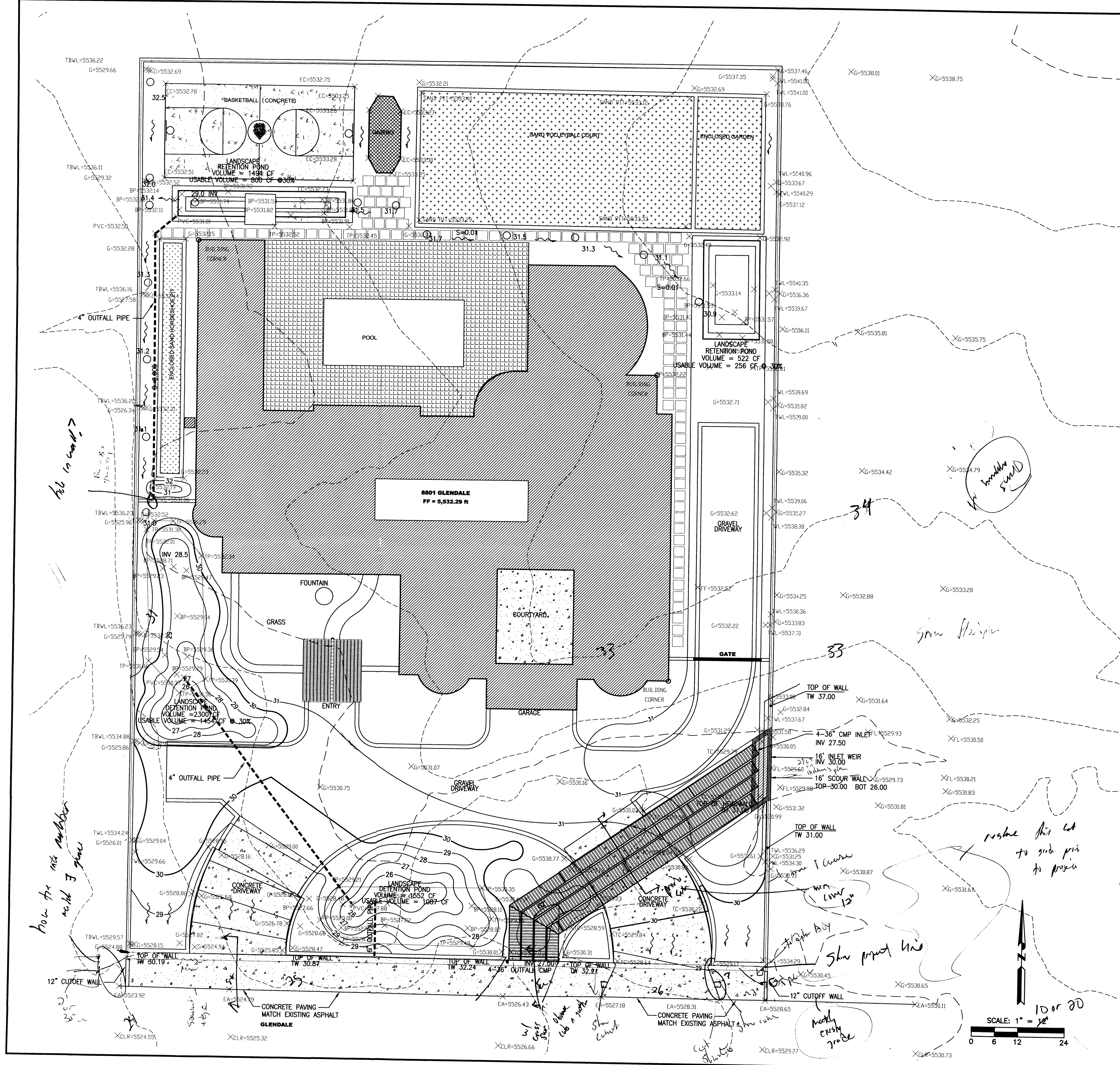
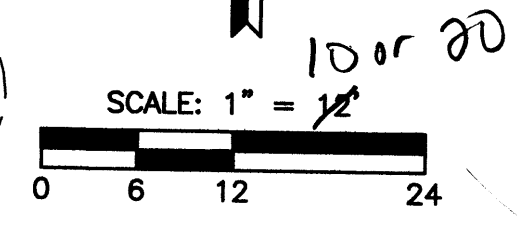




RETAINING WALL DIMENSIONS & REINFORCEMENT											
MIN. DIMENSIONS						STEEL REINFORCEMENT					
H	T	A	B	C	D	W	a	b	c	ld1	
2'	1'-0"	0'-6"	0'-8"	0'-10"	5 1/4"	2'-0"	#5@24" o.c.	#5@16"	#4@16"	1'-6"	
3'	1'-0"	0'-6"	0'-8"	1'-3"	5 1/4"	2'-5"	#5@16" o.c.	#5@16"	#4@16"	1'-6"	
4'	1'-0"	1'-0"	0'-8"	1'-2"	6 1/4"	2'-10"	#5@16" o.c.	#5@16"	#4@16"	1'-6"	
5'	1'-0"	1'-0"	0'-8"	1'-9"	6 1/4"	3'-5"	#5@8" o.c.	#5@16"	#4@16"	1'-6"	
6'	1'-0"	1'-0"	0'-8"	2'-6"	6 1/4"	4'-2"	#5@8" o.c.	#5@16"	#4@16"	1'-6"	

TYPICAL RETAINING WALL OVER 18"
N.T.S.



Redneck 7-820

hole in wall?

how far into rubber mat 3' from

note this to give pin to pin

5.75 x 2 = 11.5
2.43 - 1.0 = 1.43 + 1.67 = 2.62

5.75 x 2 = 11.5
1.61 x 2 = 3.22

DESIGNED BY: M.H.B.

DRAWN BY: T.D.S.

CHECKED BY:

8801 GLENDALE AVE. N.E.

GRADING AS-BUILT

1 OF 2

RECEIVED

SEP 20 2013

LAND DEVELOPMENT SECTION

Mark H. Burak, P.E.

1512 Sagebrush Trail SE

Albuquerque, New Mexico, 87123

(505) 296-0461

DESIGNED BY: M.H.B.

DRAWN BY: T.D.S.

CHECKED BY:

8801 GLENDALE AVE. N.E.

GRADING AS-BUILT

1 OF 2

RECEIVED

SEP 20 2013

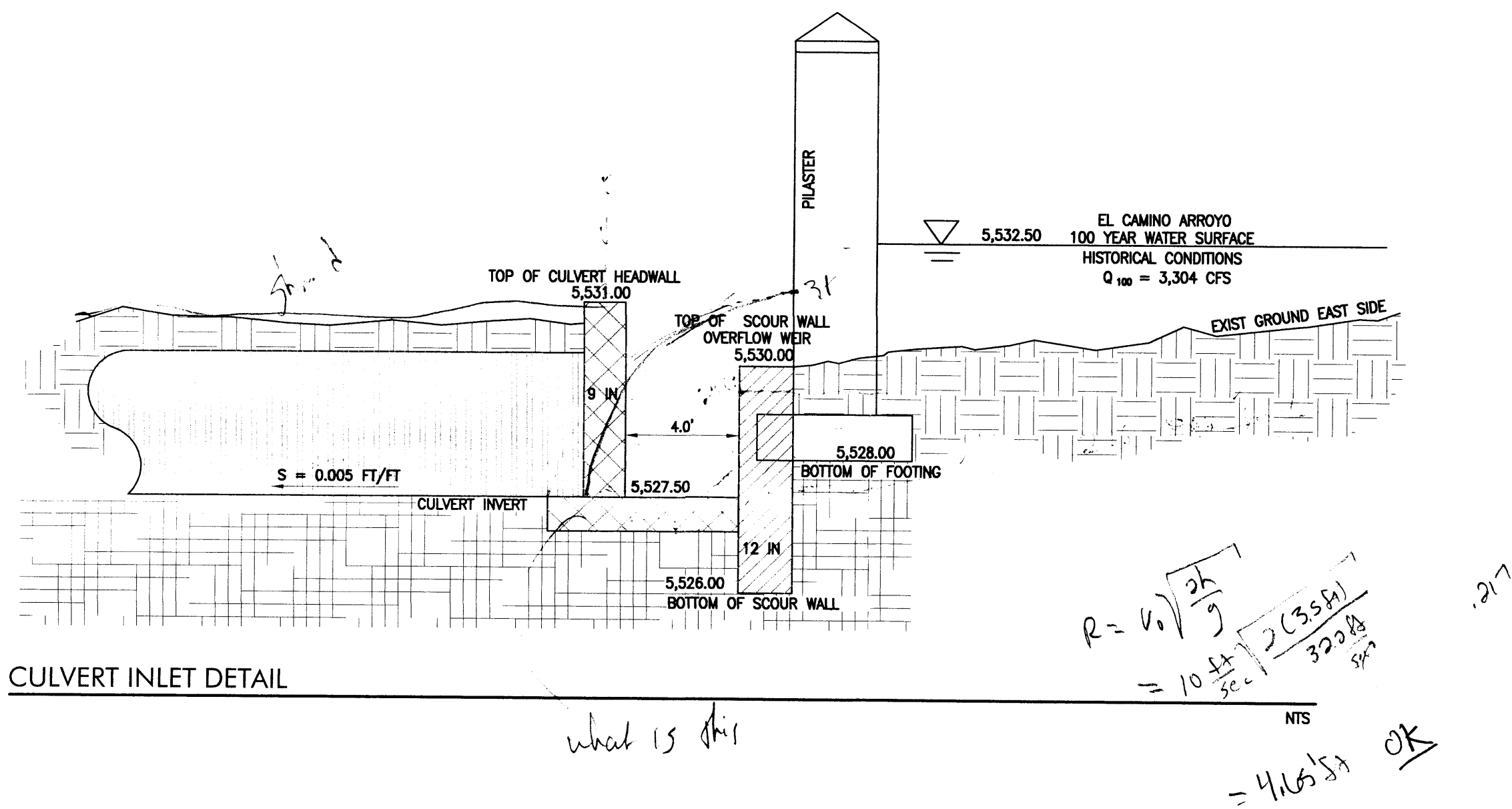
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Mark H. Burak, P.E.

1512 Sagebrush Trail SE

Albuquerque, New Mexico, 87123

(505) 296-0461



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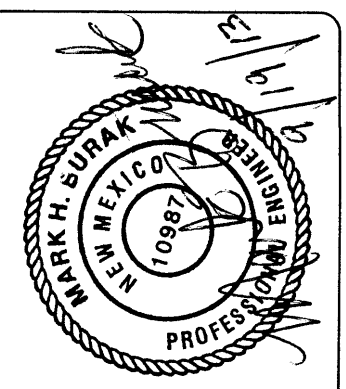
TRAPEZOIDAL CHANNEL			
Normal depth and critical depth parameters			
El Camino North Branch at Wall			
Input variables:		Output Parameters:	
Discharge	275 cfs	Normal depth	2.50 ft
Channel slope	0.03000 ft/ft	Normal velocity	10.00 fps
Manning's n	0.035	Froude number	1.34
Bottom width	6 ft	Critical Depth	2.93 ft
Left side slope	2 H:1	EGL Depth	4.05 ft
Right side slope	2 H:1	Scour Depth	2.72 ft
Curve Rad us	1000 ft	Super-elevation	0.06 ft
		Freeboard	2.34 ft
		Channel Depth	4.90 ft
		Sequent Depth	3.30 ft
Note:		$\text{Freeboard} = (2+0.025(\text{velocity})(\text{depth})^{1/3})$	
		BURAk	

[illegible]

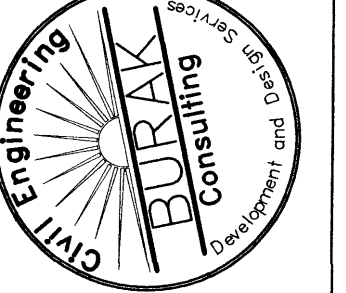
DESIGNED BY: M.H.B.

DRAWN BY: T.D.S.

CHECKED BY:



Mark H. Burak, P.E.
1512 Sagebrush Trail SE
Albuquerque, New Mexico, 87123
(505) 296-0461



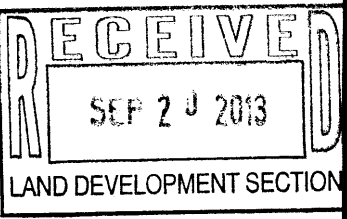
88801 GLENDALE AVE. N.E.

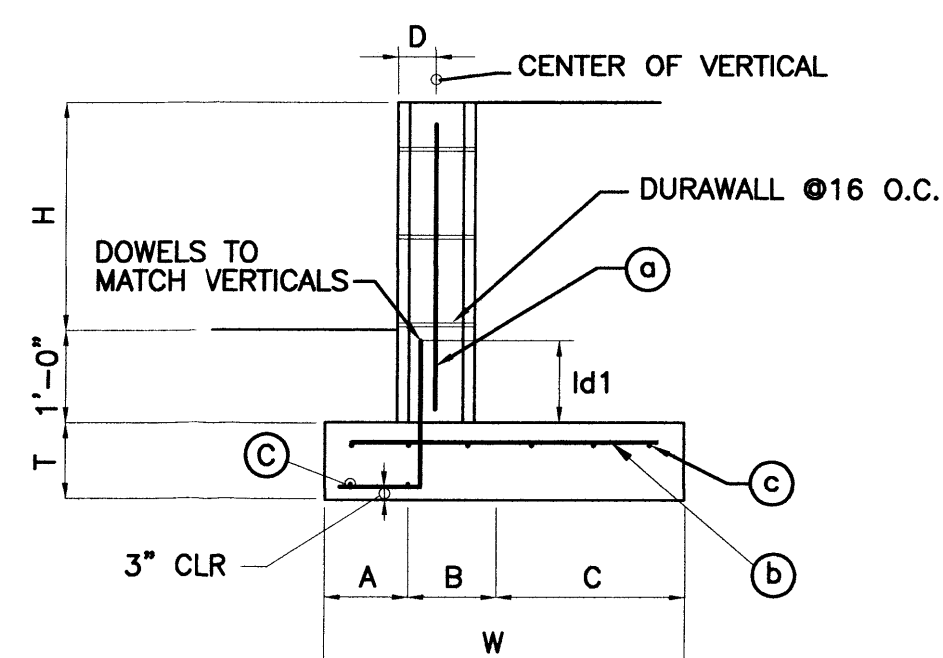
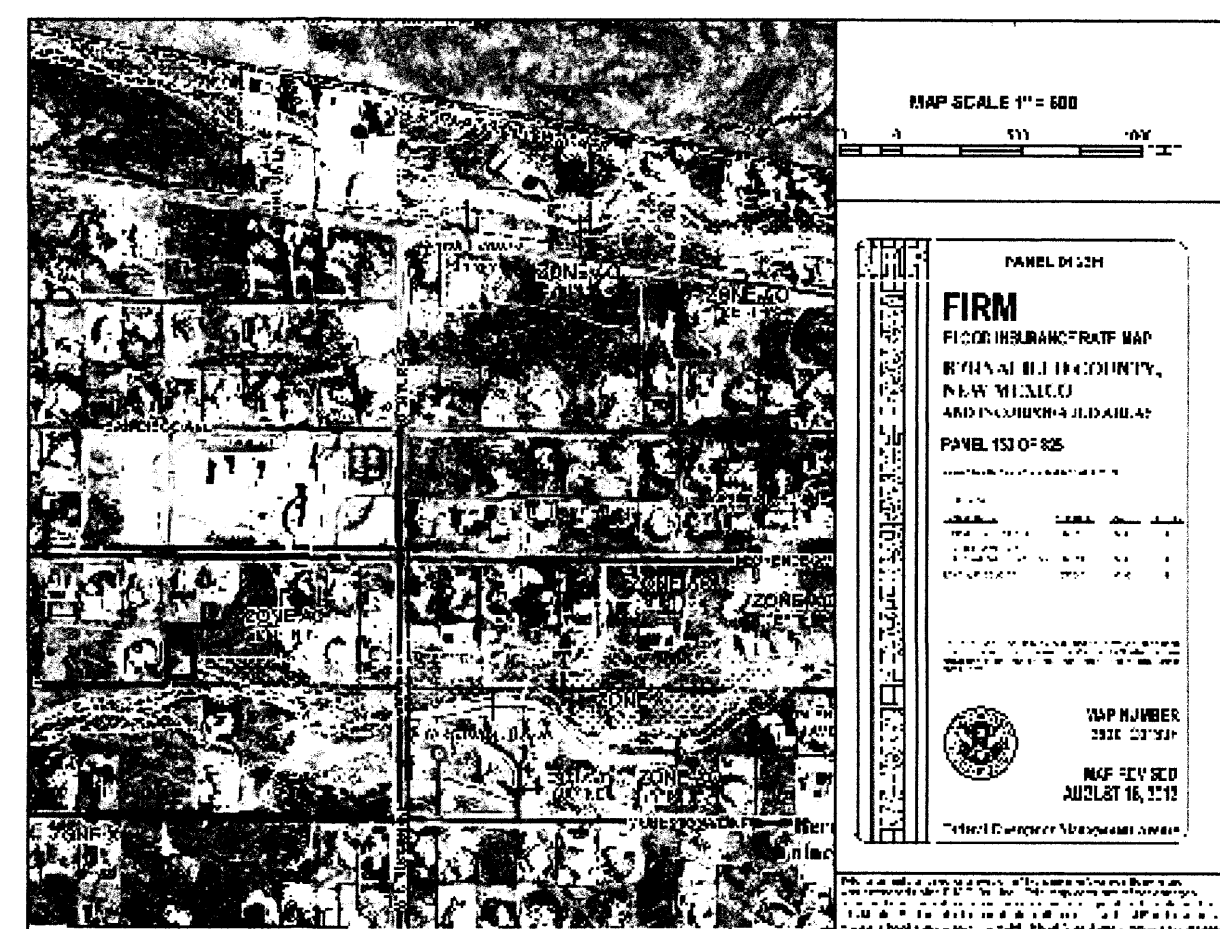
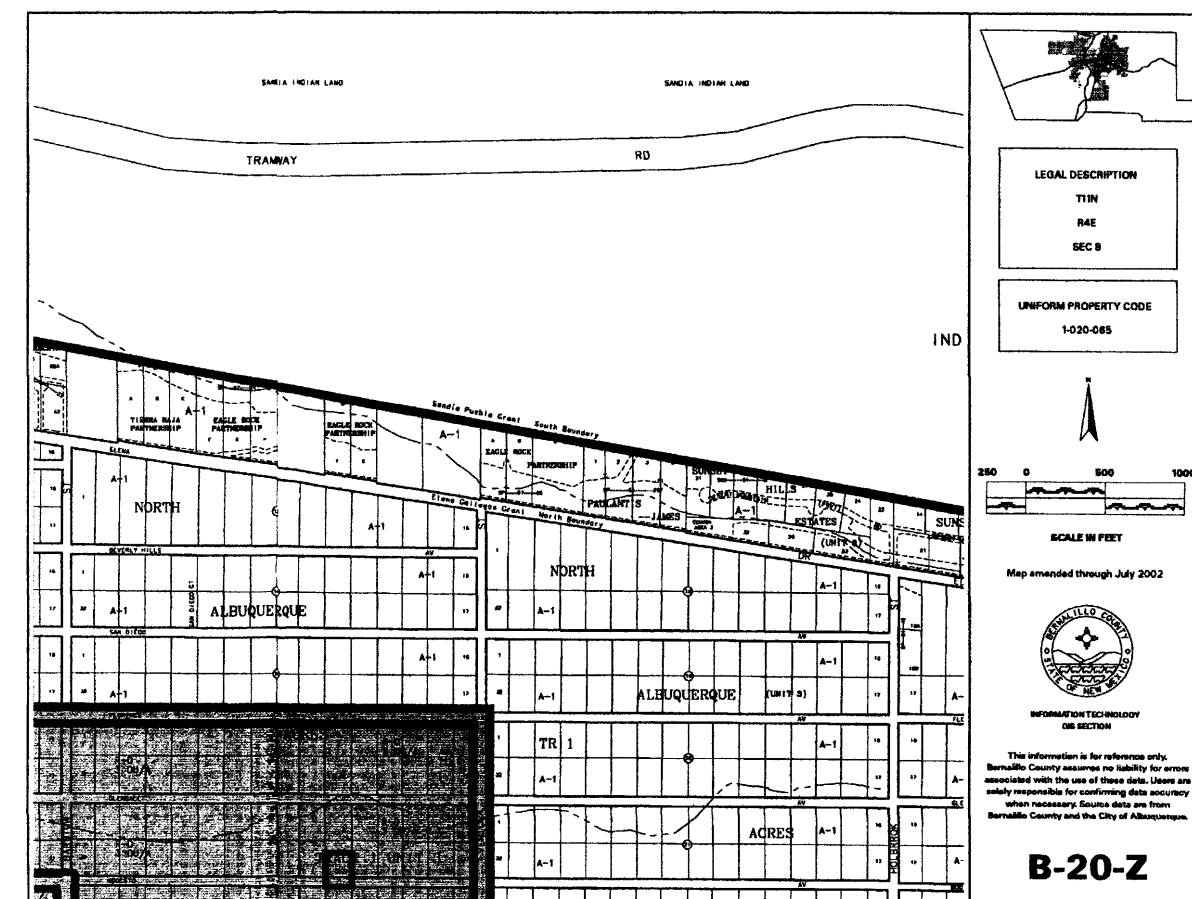
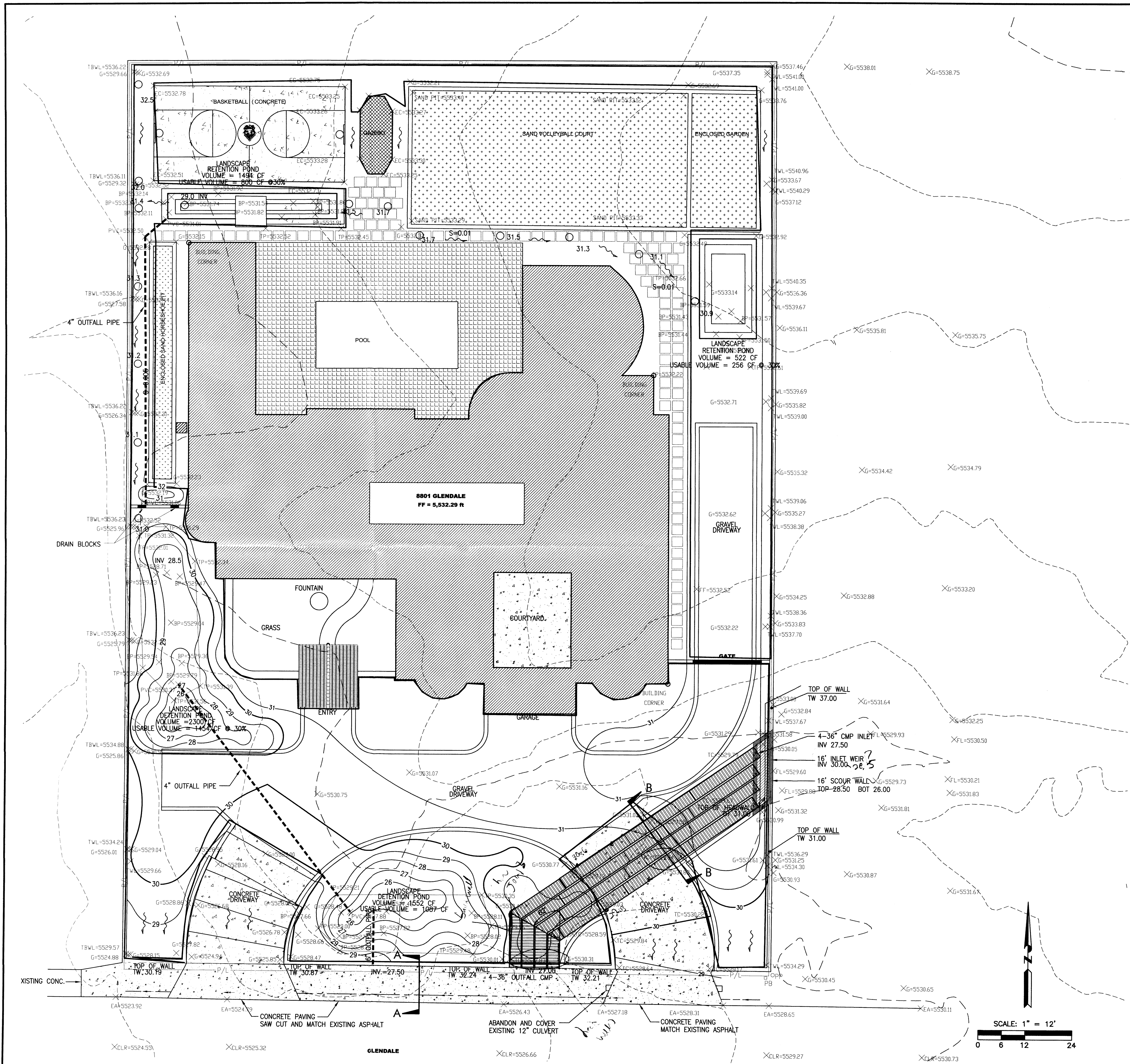
CALCULATIONS AND DETAILS

DRAWING NUMBER

C2

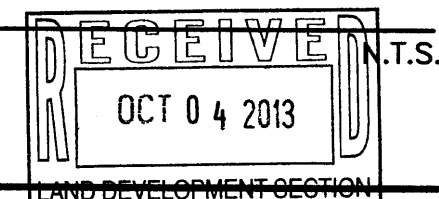
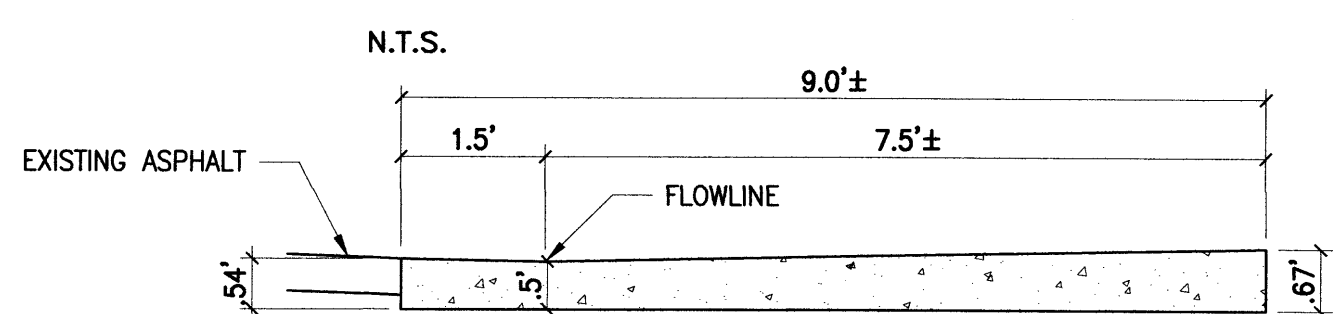
2 OF 2





RETAINING WALL DIMENSIONS & REINFORCEMENT											
MIN. DIMENSIONS							STEEL REINFORCEMENT				
H	T	A	B	C	D	W	a	b	c	ld1	
2'	1'-0"	0'-6"	0'-8"	0'-10"	5 1/4"	2'-0"	#5@24" o.c.	#5@16" o.c.	#4@16"	1'-6"	
3'	1'-0"	0'-6"	0'-8"	1'-3"	5 1/4"	2'-5"	#5@16" o.c.	#5@16" o.c.	#4@16"	1'-6"	
4'	1'-0"	1'-0"	0'-8"	1'-2"	6 1/4"	2'-10"	#5@16" o.c.	#5@16" o.c.	#4@16"	1'-6"	
5'	1'-0"	1'-0"	0'-8"	1'-9"	6 1/4"	3'-5"	#5@8" o.c.	#5@16" o.c.	#4@16"	1'-6"	
6'	1'-0"	1'-0"	0'-8"	2'-6"	6 1/4"	4'-2"	#5@8" o.c.	#5@16" o.c.	#4@16"	1'-6"	

TYPICAL RETAINING WALL OVER 18"



DESIGNED BY: M.H.B.	DRAWN BY: T.D.S.	CHECKED BY:	DATE MARK
REVISION			
8801 GLENDALE AVE. N.E.			
GRADING AND DRAINAGE PLAN			
DRAWING NUMBER			
C1			
1 OF 2			

Site Location - As shown by the Vicinity Map (Zone Atlas Map B-20), the 0.88 acre site on Glendale is located approximately 500 feet west of the intersection of Ventura and Glendale. At present, the site is fully developed and drains roughly from north to south into the integrated on-site detention pond system. Offsite runoff impacting the southeast corner of the property discharges east to west from a portion of the existing El Camino Arroyo. The purpose of this project was to construct a residential structure located outside of the potential flood area associated with the adjacent arroyo. The property to the east is currently undeveloped. Only one residence has been constructed on the south side of Glendale Avenue between Ventura and Barstow. This residence is located across Glendale and one lot east of the subject property.

Legal Description - 8801 Glendale Avenue, Lot 22, Block 16, Tract 1, Unit 3, North Albuquerque Acres, Albuquerque, New Mexico. UPC 102006517406930211

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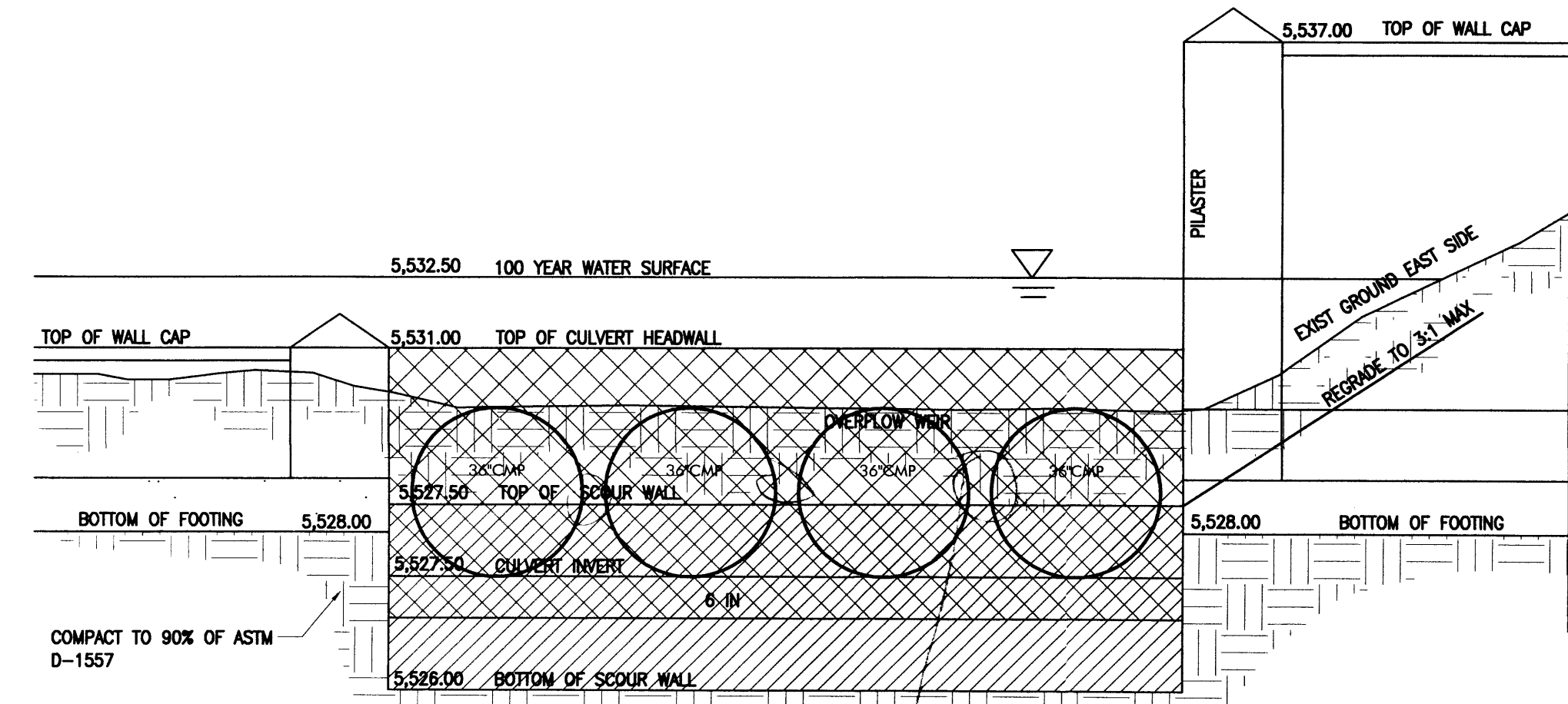
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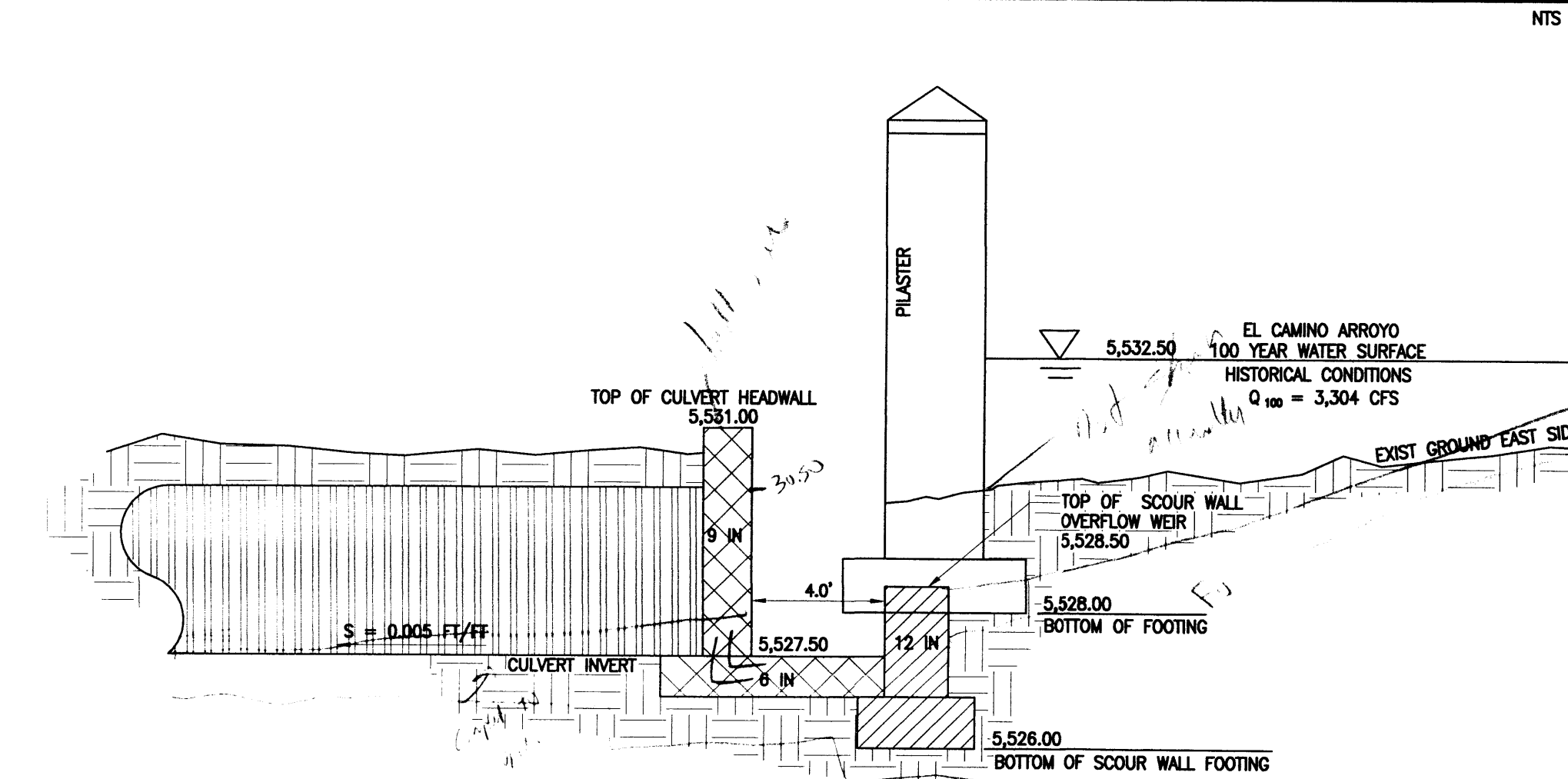
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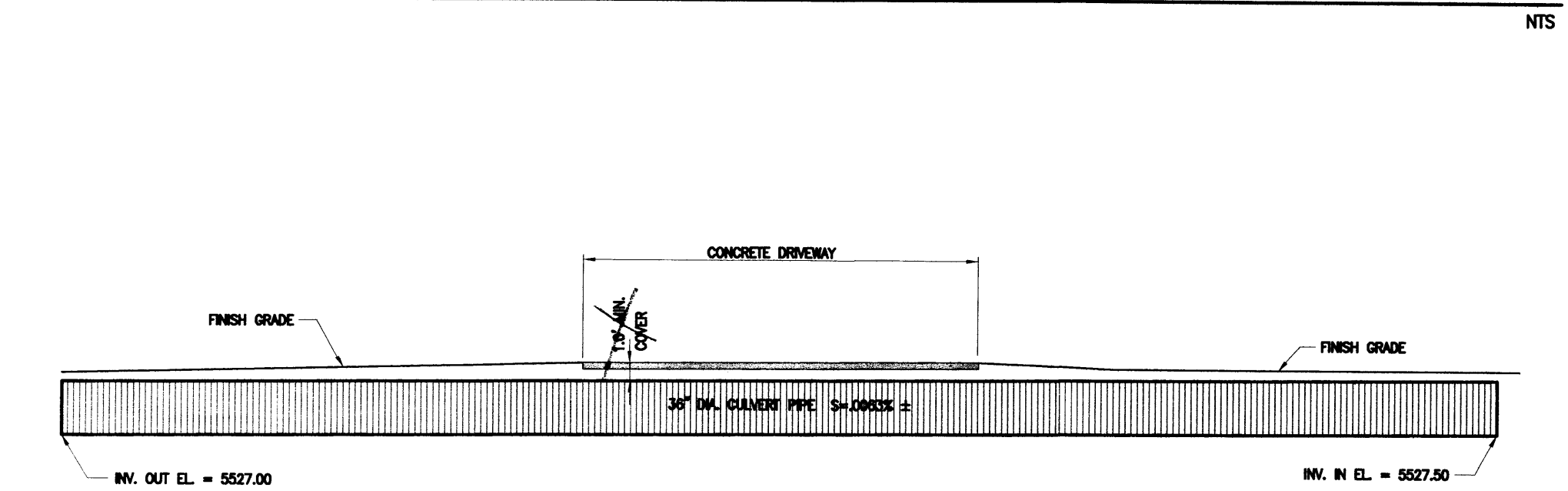
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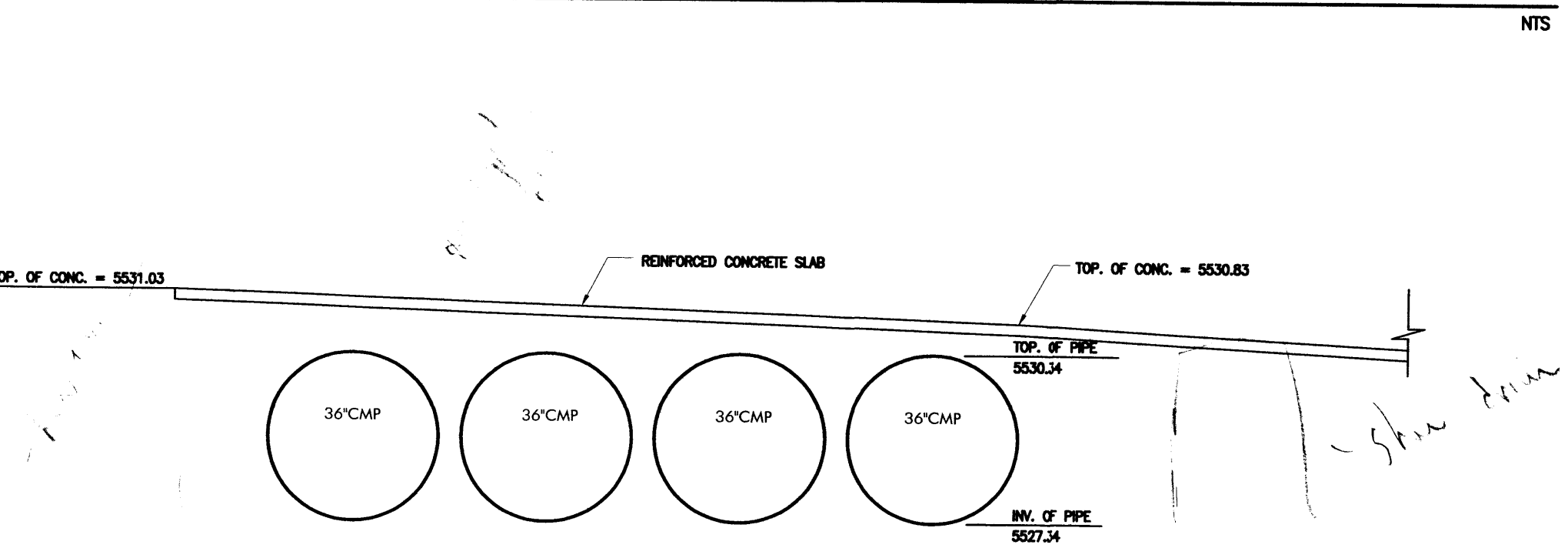
CULVERT INLET DETAIL



CULVERT INLET DETAIL

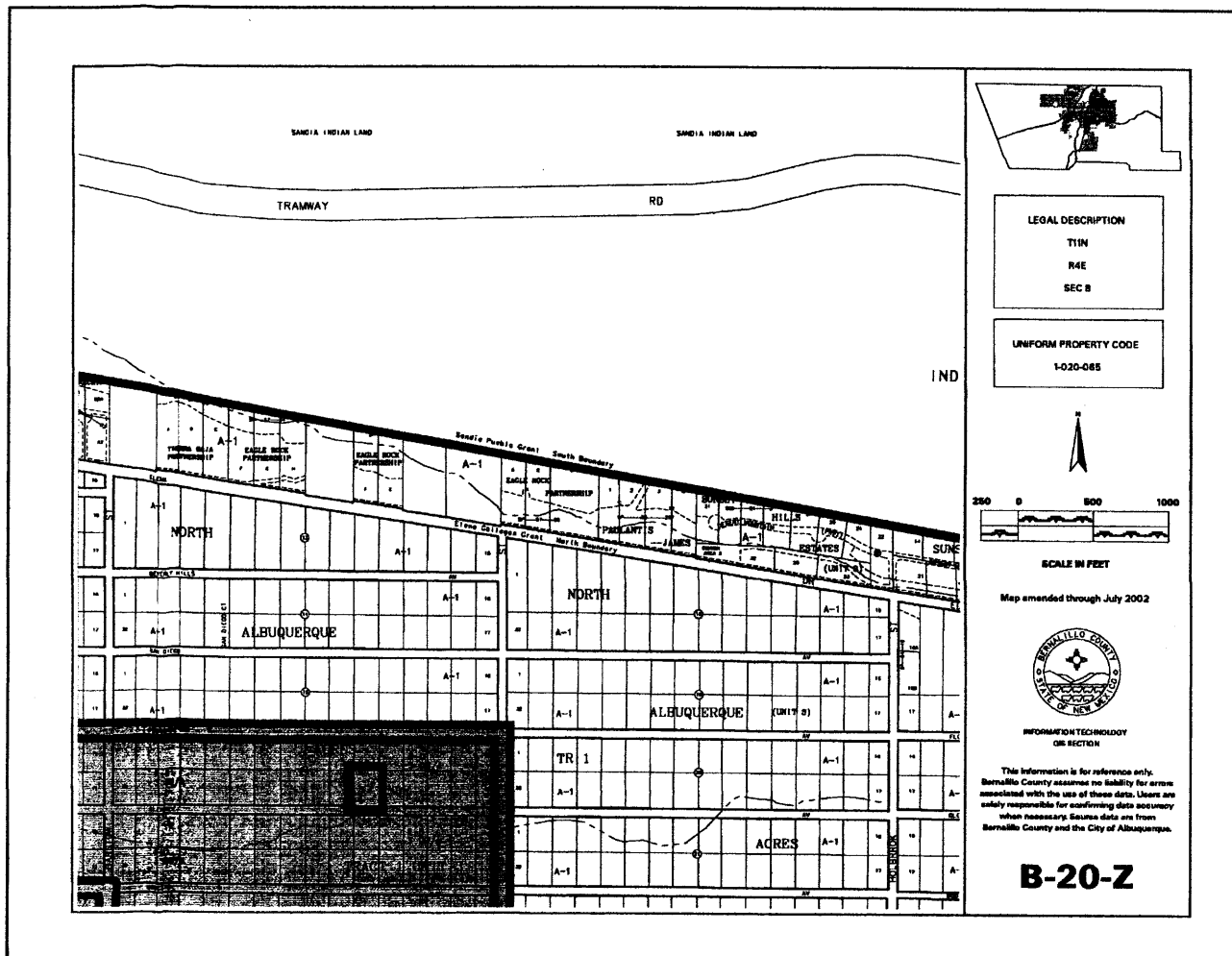
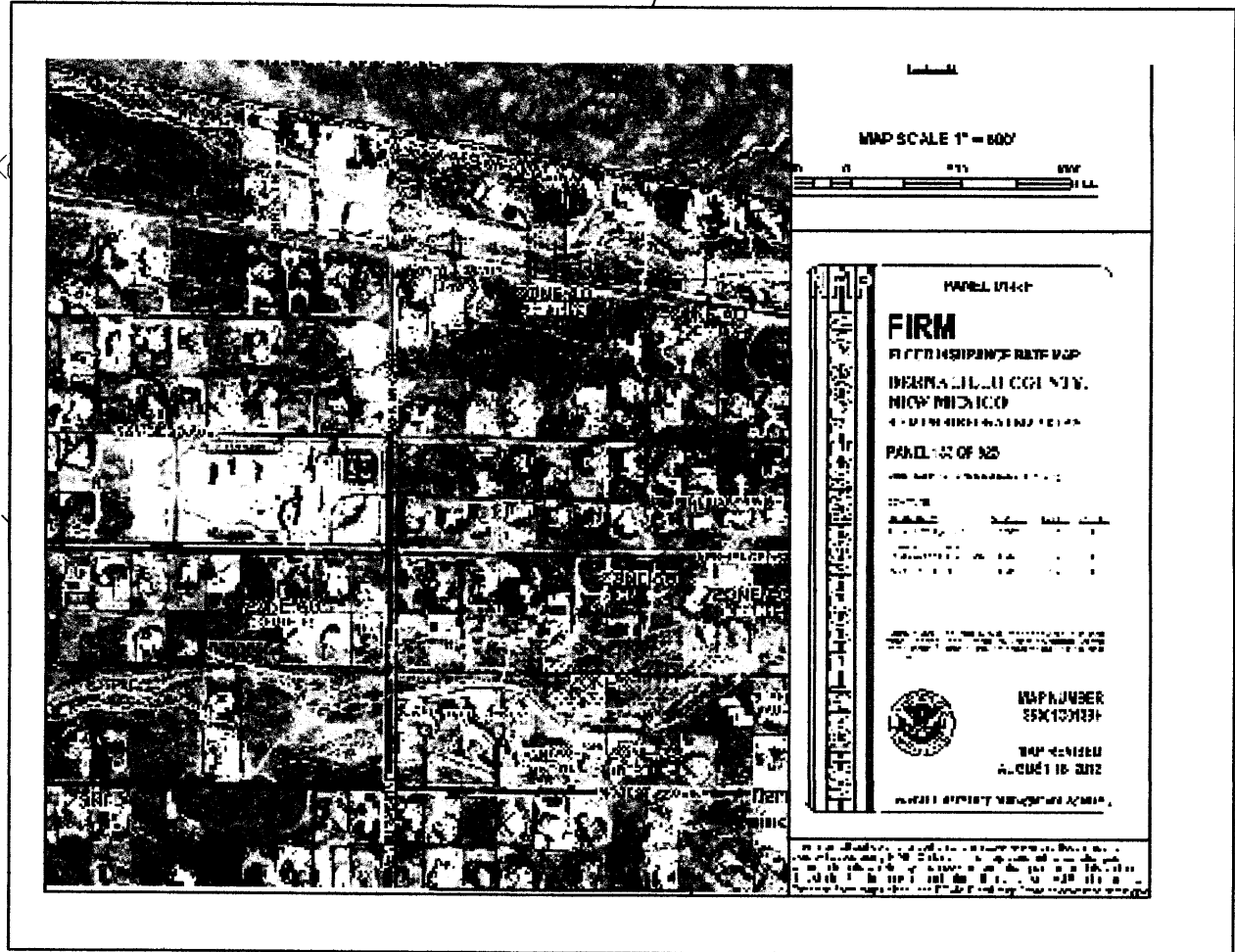
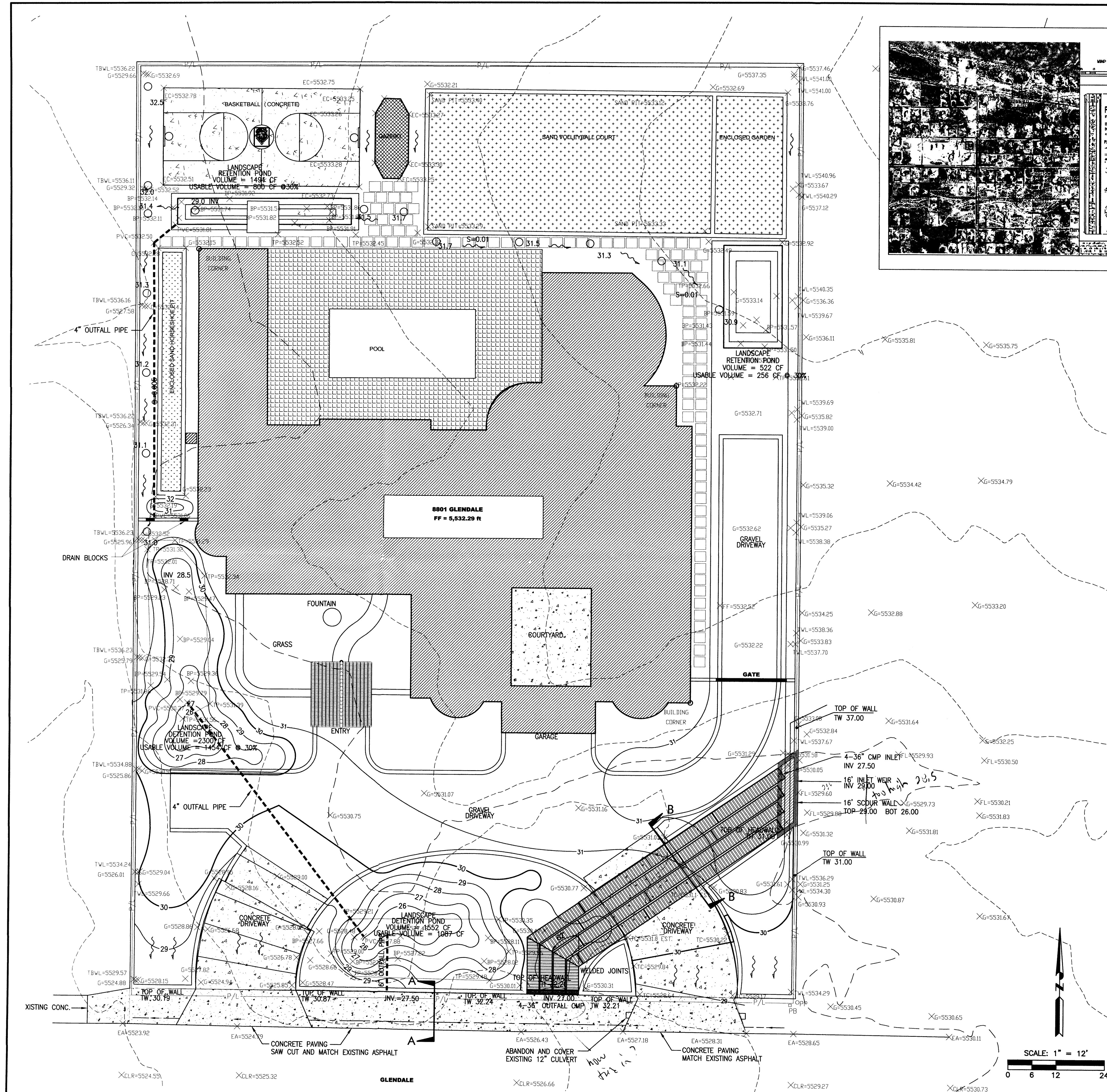


DRIVEWAY CULVERT SECTION



DRIVEWAY CULVERT SECTION B-B

Hydrologic Calculations - COA DPM 22.2										Gary Padilla Residence					
Precipitation	(inches)				P60	P360	P1440	P4days	P10days	8801 Glendale Ave. September 18, 2013					
Zone 3					2.14	2.6	3.1	3.95	4.9						
Excess	(inches)									(inches)					
Precipitation	0.66	0.92	1.29	2.36		0.66	0.92	1.29	2.36	0.66 0.92 1.29 2.36					
Peak	(cfs/acre)									(cfs/acre)					
Discharge	1.87	2.6	3.45	5.02		1.87	2.6	3.45	5.02	1.87 2.6 3.45 5.02					
Drainage Areas	Land Treatments - Historical Conditions					Land Treatments - Allowed Developed Conditions					Land Treatments - Proposed Developed Conditions				
	A	B	C	D	Area (ac)	A	B	C	D	Area (ac)	A	B	C	D	Area (ac)
Lot 7	0.88	0.00	0.00	0.00	0.88	0.38	0.18	0.18	0.15	0.88	0.11	0.04	0.31	0.42	0.88
	100%	0%	0%	0%		43%	20%	20%	17%		12%	6%	36%	48%	
Discharge	Peak Flow Rate - Historical Condition 100 yr					Peak Flow Rate - Allowed Developed Conditions 100 yr					Peak Flow Rate - Proposed Conditions 100 yr				
	A	B	C	D	Q (cfs)	A	B	C	D	Q (cfs)	A	B	C	D	Q (cfs)
Lot 7	1.65	0.00	0.00	0.00	1.65	0.71	0.46	0.61	0.75	2.52	0.20	0.11	1.06	2.12	3.49
Volume Six Hour	Runoff Volume - Historical Conditions 100 yr					Runoff Volume - Allowed Developed Conditions 100 yr					Runoff Volume - Proposed Conditions 100 yr				
	Six Hour Storm					Six Hour Storm					Six Hour Storm				
Lot 7	2,108	0	0	0	2,108	907	588	824	1,282	3,600	253	147	1,442	3,619	5,461



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Bench Mark - City of Albuquerque "7-B20" NAVD88

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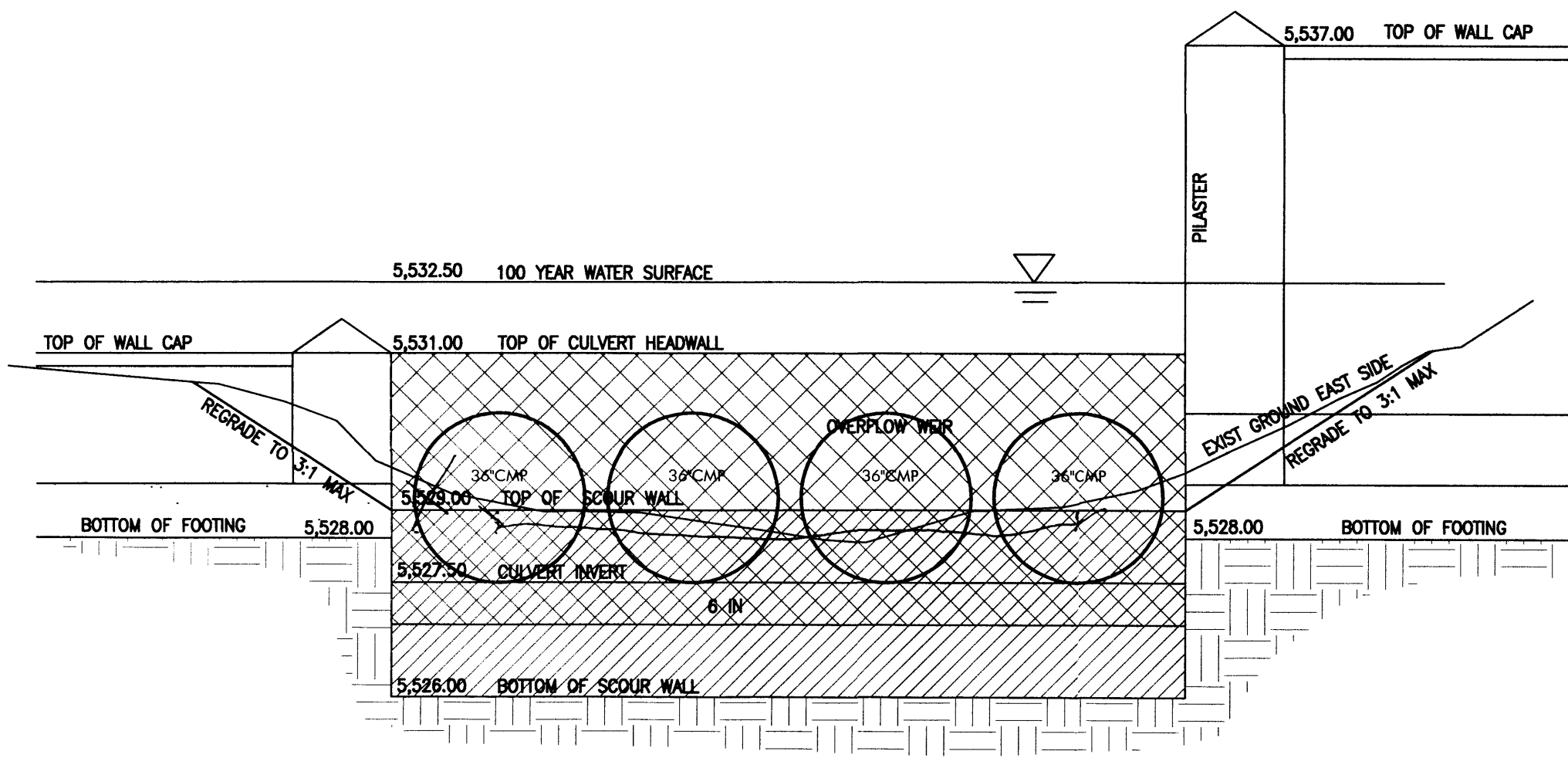
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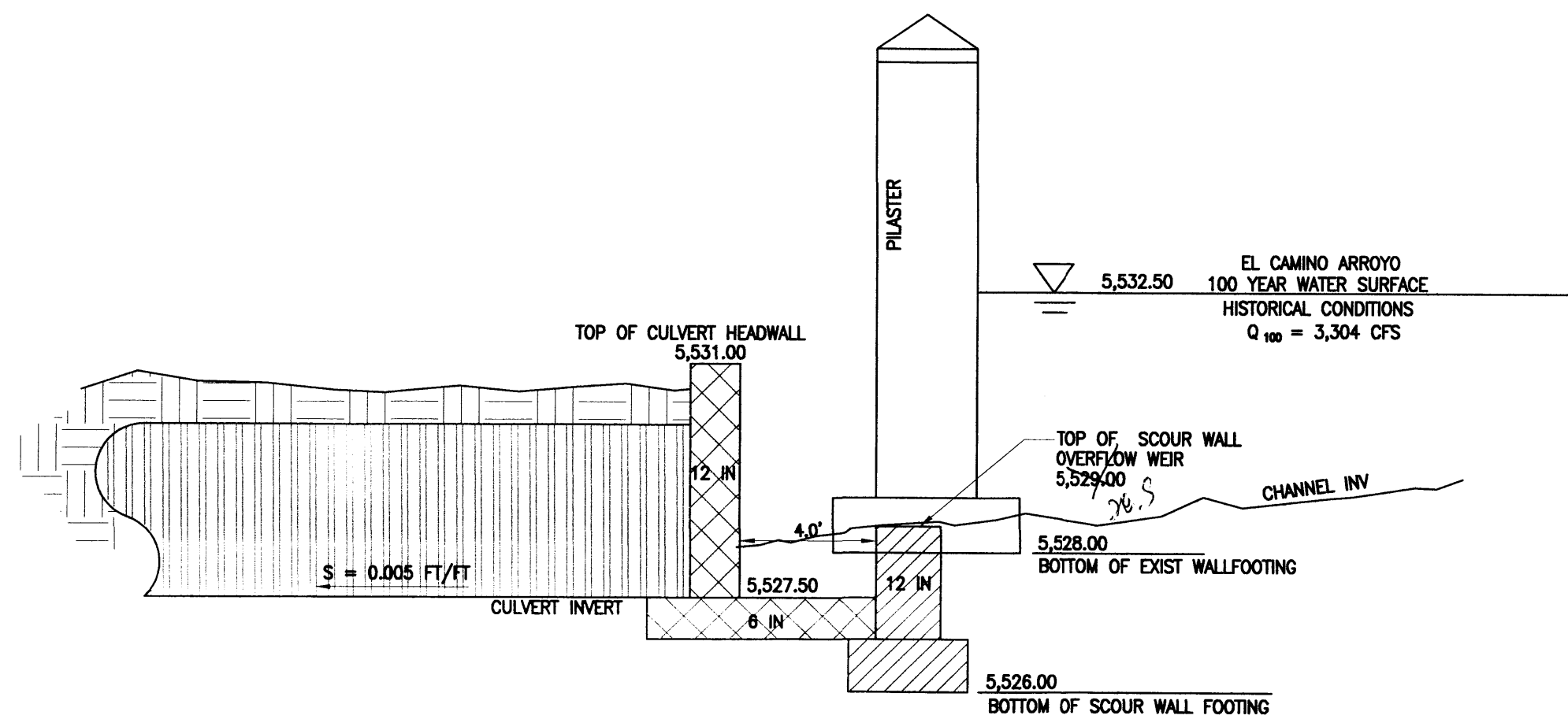
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Recommended Improvements - To mitigate potential lateral erosion onto the project site, a four foot deep floodwall is proposed along the eastern property boundary at the wall opening to the northern branch of the El Camino Arroyo. The offsite runoff will drop 1.5 feet over the top of the scour wall as a 16 foot weir opening into a four foot wide concrete catch basin. Four 36-inch diameter CMP culverts will carry the runoff under the driveway and will discharge into Glendale Avenue in the historical location. The capacity of the culvert battery was calculated at 243-cfs based on the maximum headwater depth associated with the calculated historical water surface at the wall. The calculated capacity of the northern arroyo branch that impacts the wall was estimated at 220-cfs at the same maximum water surface elevation. This water surface elevation is approximately one foot higher than the ridgeline between the northern arroyo branch and Glendale Avenue. The ridgeline is about 1.5 feet higher than the bottom of the northern branch flowline and 2.5 feet higher than the Glendale flowline. Runoff in excess of the culvert capacity will overtop the perimeter wall and the culvert headwall and will discharge down the existing concrete driveway into Glendale Avenue.

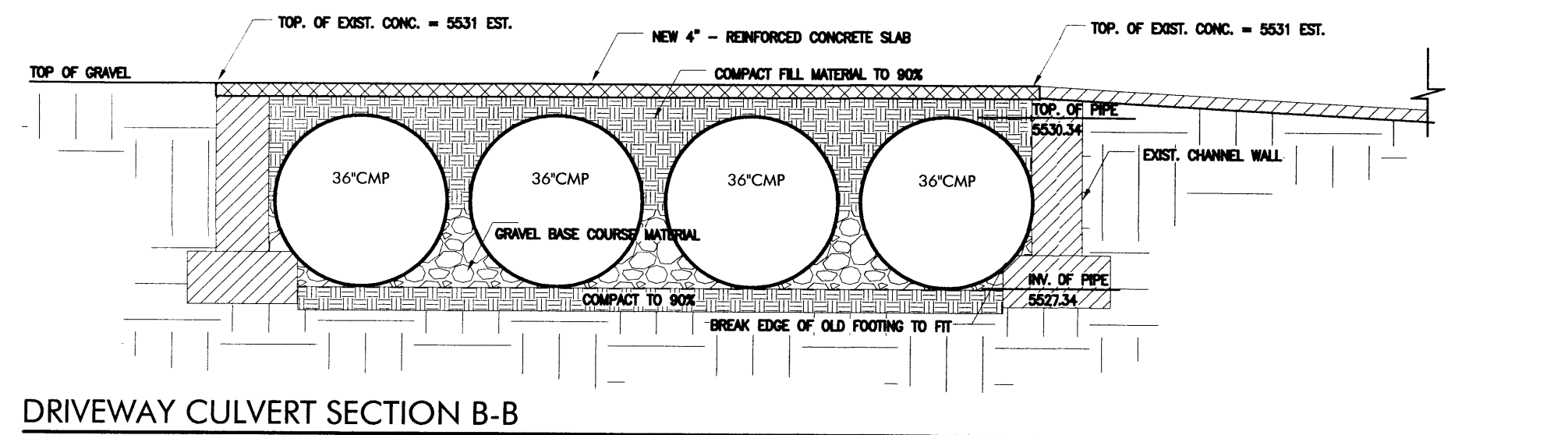
DESIGNED BY: M.H.B.		DRAWN BY: T.D.S.		CHECKED BY:	
Mark H. Burek, P.E.		1512 Sagebrush Trail SE		Albuquerque, New Mexico, 87123	
BUREK CONSULTING		(505) 298-0461			
B801 GLENDALE AVE. N.E.					
GRADING AND DRAINAGE PLAN					
DRAWING NUMBER					
C1					
1 OF 2					



CULVERT INLET DETAIL



CULVERT INLET DETAIL

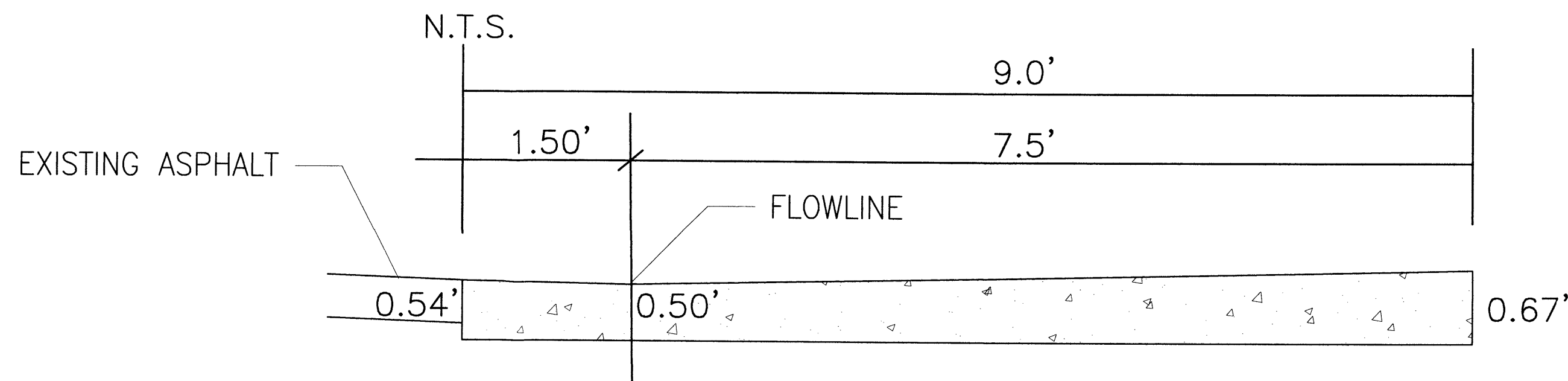


DRIVEWAY CULVERT SECTION B-B

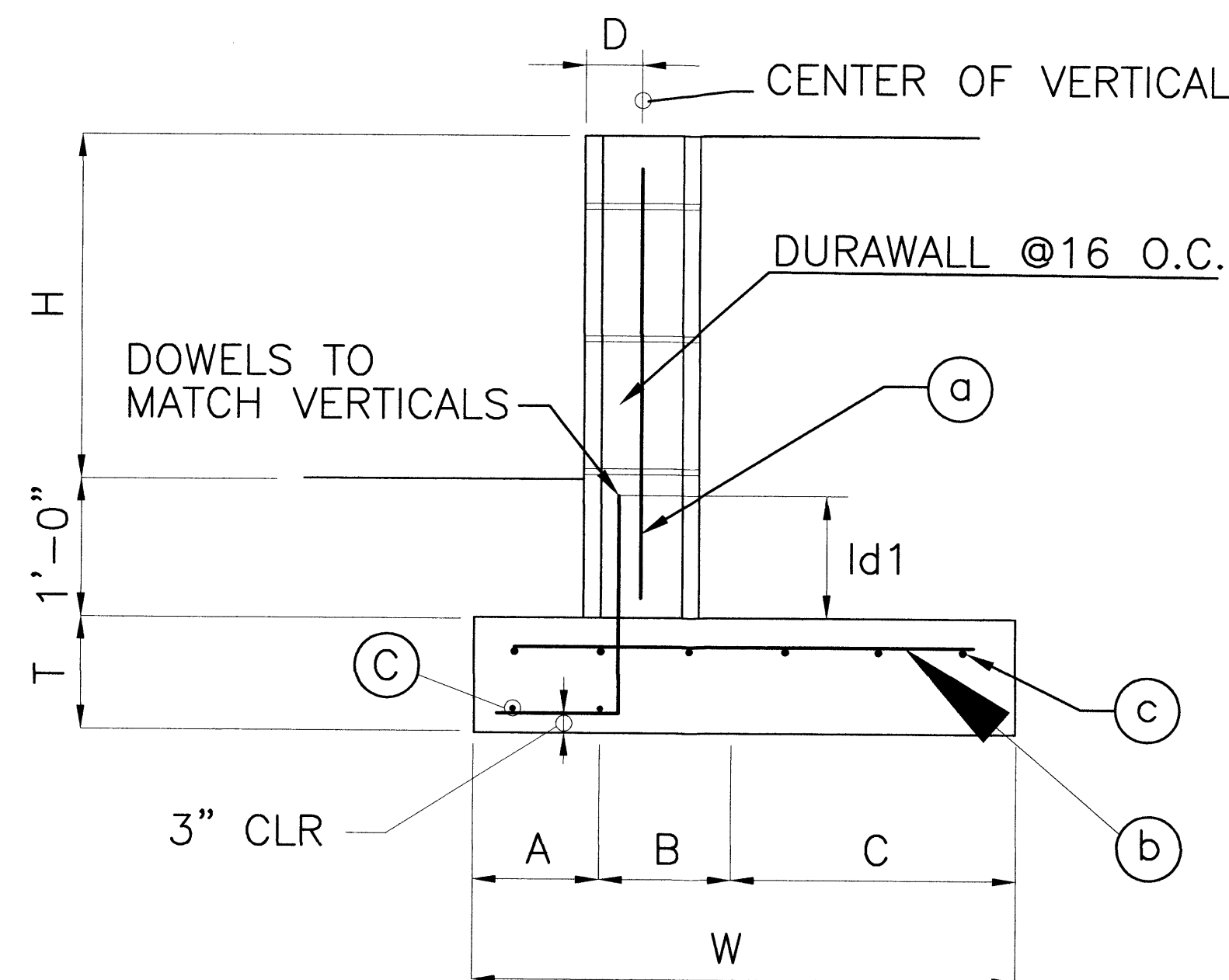
Hydrologic Calculations - COA DPM 22.2											Gary Padilla Residence 8801 Glendale Ave. September 19, 2013				
Precipitation Zone 3	(inches) P60 P360 P1440 P4days P10days 2.14 2.6 3.1 3.95 4.9														
Excess Precipitation	(inches) 0.66 0.92 1.29 2.36 0.66 0.92 1.29 2.36										(inches) 0.66 0.92 1.29 2.36				
Peak Discharge	(cfs/acre) 1.87 2.6 3.45 5.02 1.87 2.6 3.45 5.02										(cfs/acre) 1.87 2.6 3.45 5.02				
Drainage Areas	Land Treatments - Historical Conditions					Land Treatments - Allowable Developed Conditions					Land Treatments - Proposed Developed Conditions				
	A	B	C	D	Area (ac)	A	B	C	D	Area (ac)	A	B	C	D	Area (ac)
	Lot 7	0.88	0.00	0.00	0.00	0.88	0.38	0.18	0.18	0.15	0.88	0.11	0.04	0.31	0.42
	100%	0%	0%	0%		43%	20%	20%	17%		12%	5%	35%	48%	
Discharge Lot 7	Peak Flow Rate - Historical Condition 100 yr					Peak Flow Rate - Allowed Developed Conditions 100 yr					Peak Flow Rate - Proposed Conditions 100 yr				
	A	B	C	D	Q (cfs)	A	B	C	D	Q (cfs)	A	B	C	D	Q (cfs)
	1.65	0.00	0.00	0.00	1.65	0.71	0.46	0.61	0.75	2.52	0.20	0.11	1.06	2.12	3.49
Volume Six Hour Lot 7	Runoff Volume - Historical Conditions 100 yr					Runoff Volume - Allowed Developed Conditions 100 yr					Runoff Volume - Proposed Conditions 100 yr				
	Six Hour Storm V (cu-ft)					Six Hour Storm V (cu-ft)					Six Hour Storm V (cu-ft)				
	2,108	0	0	0	2,108	907	588	824	1,282	3,600	253	147	1,442	3,619	5,461
											Differential 1861 cf				
Volume Ten Day Lot 7	Runoff Volume - Historical Conditions 100 yr					Runoff Volume - Allowed Developed Conditions 100 yr					Runoff Volume - Proposed Conditions 100 yr				
	Ten Day Storm Event V (cu-ft)					Ten Day Storm Event V (cu-ft)					Ten Day Storm Event V (cu-ft)				
	2,108					4,849					8,987	Differential 4138 cf			

PIPE CULVERT		
Inlet control and outlet control parameters		
8801 Glendale - El Camino Arroyo		
Pipe diameter	36 in	INLET CTRL HWO: beveled edge 4.65 ft
Number of pipes	4	sq edge headwall 5.00 ft
Slope	0.005 ft/ft	thin edged proj 5.90 ft
Manning's n	0.024	OUTLET CTRL HWO: velocity 8.6 fps
Culvert length	80 ft	critical depth 2.48 ft
Discharge	243.00 cfs	
BURAK		

TRAPEZOIDAL CHANNEL		
Normal depth and critical depth parameters		
El Camino North Branch at Wall		
Input variables:		
Discharge	275 cfs	Normal depth 2.50 ft
Channel slope	0.03000 ft/ft	Normal velocity 10.00 fps
Manning's n	0.035	Froude number 1.34
Bottom width	6 ft	Critical Depth 2.93 ft
Left side slope	2 H:1	EGL Depth 4.05 ft
Right side slope	2 H:1	Scour Depth 2.72 ft
Curve Radius	1000 ft	Superelevation 0.06 ft
		Freeboard 2.34 ft
		Channel Depth 4.90 ft
		Sequent Depth 3.30 ft
Note: Freeboard = (2+0.025(velocity)(depth)^(1/3))		
BURAK		

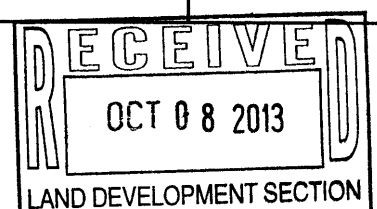


SECTION A-A



TYPICAL RETAINING WALL OVER 18"

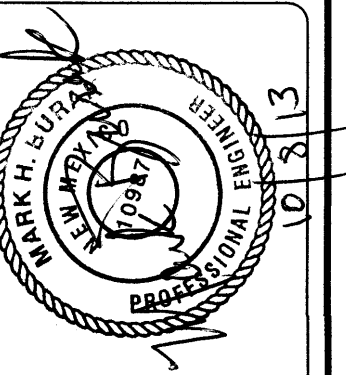
RETAINING WALL DIMENSIONS & REINFORCEMENT										
MIN. DIMENSIONS							STEEL REINFORCEMENT			
H	T	A	B	C	D	W	a	b	c	ld1
2'	1'-0"	0'-6"	0'-8"	0'-10"	5 1/4"	2'-0"	#5@24" o.c.	#5@16"	#4@16"	1'-6"
3'	1'-0"	0'-6"	0'-8"	1'-3"	5 1/4"	2'-5"	#5@16" o.c.	#5@16"	#4@16"	1'-6"
4'	1'-0"	1'-0"	0'-8"	1'-2"	6 1/4"	2'-10"	#5@16" o.c.	#5@16"	#4@16"	1'-6"
5'	1'-0"	1'-0"	0'-8"	1'-9"	6 1/4"	3'-5"	#5@8" o.c.	#5@16"	#4@16"	1'-6"
6'	1'-0"	1'-0"	0'-8"	2'-6"	6 1/4"	4'-2"	#5@8" o.c.	#5@16"	#4@16"	1'-6"



DESIGNED BY: M.H.B.

DRAWN BY: T.D.S.

CHECKED BY:



Mark H. Burak, P.E.
1512 Sagebrush Trail SE
Albuquerque, New Mexico, 87123
(505) 296-0461



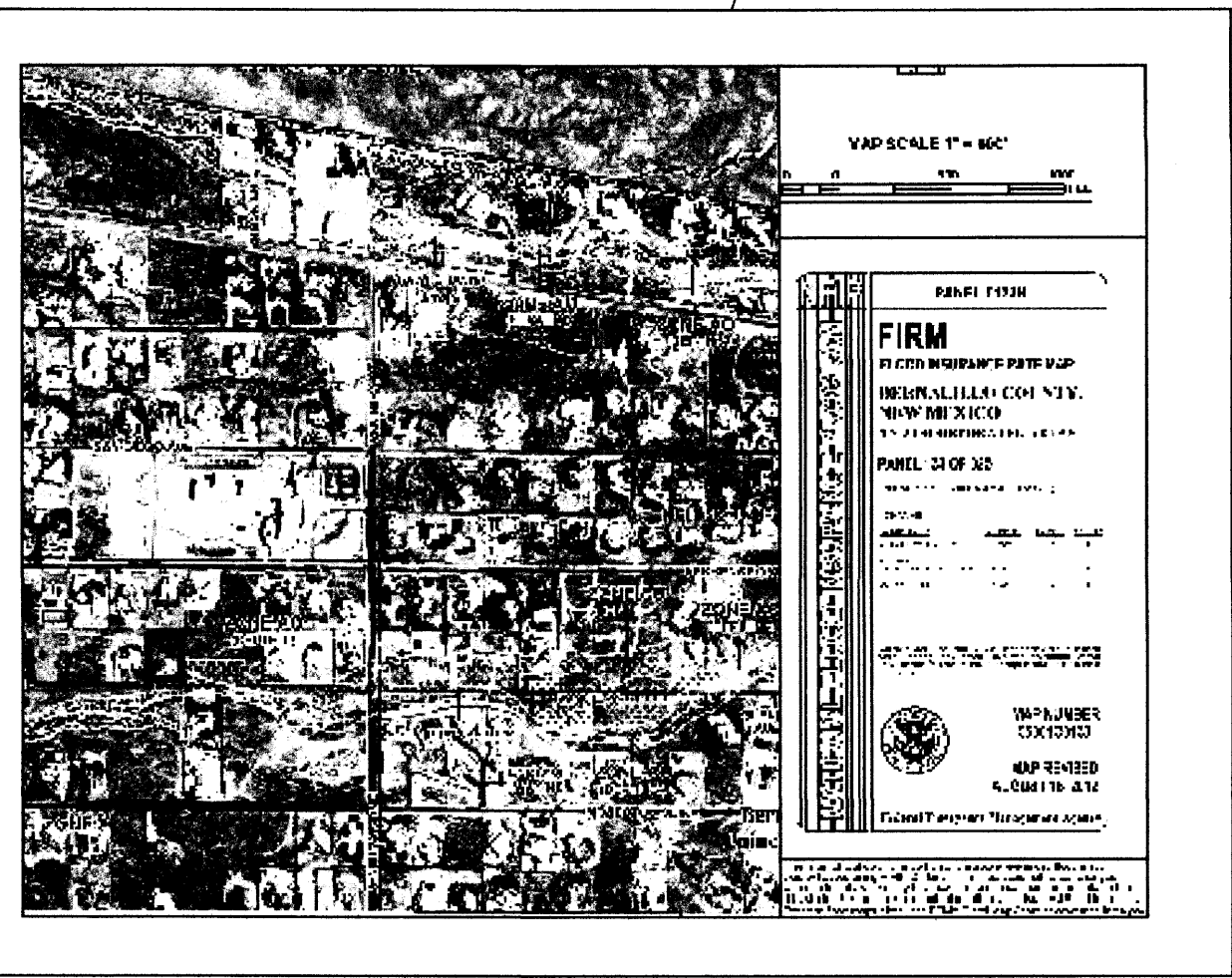
8801 GLENDALE AVE. N.E.

CALCULATIONS AND DETAILS

DRAWING NUMBER

C2

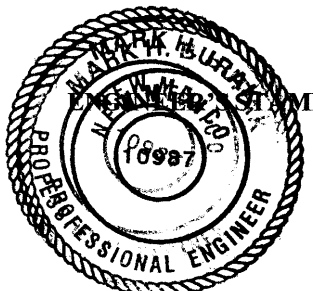
2 OF 2



I, **Mark H. Burak, P.E.**, NMPE 10987, of the FIRM **Burak Consulting**, HEREBY CERTIFY THAT THIS PROJECT HAS BEEN GRADED AND WILL DRAIN IN SUBSTANTIAL COMPLIANCE WITH AND IN ACCORDANCE WITH THE DESIGN INTENT OF THE APPROVED PLAN DATED **October 8th 2013**. THE RECORD INFORMATION EDITED ONTO THE ORIGINAL DESIGN DOCUMENT HAS BEEN OBTAINED BY **Tony Harris**, NMPS **11463** OF THE FIRM **Harris Surveying, Inc.** I FURTHER CERTIFY THAT I HAVE PERSONALLY VISITED THE PROJECT SITE ON **November 18th 2013** AND AM INFORMED BY VISUAL INSPECTION THAT THE SURVEY DATA PROVIDED IS REPRESENTATIVE OF ACTUAL SITE CONDITIONS AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. THIS CERTIFICATION IS SUBMITTED IN SUPPORT OF A REQUEST FOR **Certificate of Occupancy**.

THE RECORD INFORMATION PRESENTED HEREON IS NOT NECESSARILY COMPLETE AND INTENDED ONLY TO VERIFY SUBSTANTIAL COMPLIANCE OF THE GRADING AND DRAINAGE ASPECTS OF THIS PROJECT. THOSE RELYING ON THE RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE USING IT FOR ANY OTHER PURPOSE.

Signature of Engineer: Mark Buzak
Date: 12/3/13



Bench Mark - City of Albuquerque "7-B20" NAVD88

Flood Zone - As shown by Panel 133 of 825 of the National Flood Insurance Program Flood Insurance Rate Maps (FIRM) for the City of Albuquerque, New Mexico, dated September 26, 2008, a portion of this site does lie within a designated flood hazard zone AO. Approximately 40 feet north and west of the southeast corner of the subject property is located within the designated flood zone AO.

Existing Conditions - Currently, the project site drains from northeast to southwest around the residence utilizing a series of detention ponds. The site itself generates a peak runoff rate of about 3.5-cfs and 1,861 cubic feet under current fully developed conditions.

The El Camino Arroyo has been estimated to produce 3,304-cfs in this area as outlined in the 1998 North Albuquerque Acres Drainage Master Plan. This peak is due to the Avulsion No.1 located east of Tramway Boulevard on Sandia Pueblo property. The non-avulsion flow rate is estimated at 660-cfs in this location. AMAFCA has plans for a new regional detention facility to be located at Eubank Boulevard which will also reduce the peak rate impacting the subject property. The City of Albuquerque master plan indicates that a 72" diameter storm drain pipe is to be constructed within Glendale Avenue between Ventura and Barstow. This storm drain will remove the FEMA floodplain associated with the El Camino Arroyo between Ventura and Barstow.

As-Built Plan - The as-built Grading and Drainage Plan shows 1) existing and historical grades indicated by spot elevations and contours at one foot intervals with continuity between existing and historical grades; 2) the limit of existing and historical improvements. The residence was placed near the center of the lot with a balanced cut and fill of approximately four to five feet. This has produced an adequate pad site with the residence located outside of the FEMA floodplain and higher than the calculated floodplain elevation. All grading has maintained positive drainage around the building with on-site ponding and incorporated storm drain piping. The as-built plan shows the excavated depth of each detention pond. The ponds were filled with cobbles to a final ponding depth of one foot for each pond. The cobbles were assumed to take up 70% of the excavated volume in each pond. The total remaining detention volume on the site was calculated at 3,600 cubic feet. The fully developed site generates 5,461 cubic feet of runoff volume. The calculated allowable developed volume was estimated as 3,600 cubic feet leaving a differential storage volume requirement of 1,861 cubic feet for the six-hour storm. The ten-day storm will generate 8,987 cubic feet with an allowable discharge of 4,849 cubic feet. The six-hour volumes are typically used for detention basin sizing. The ten-day volumes are typically utilized for full retention on site. This property utilizes an internal storm drain piping system to slowly drain the ponds over an extended period of about 20-hours into Glendale Avenue.

Hydrologic Methods - The drainage calculations estimate the potential runoff from the project site to assess the peak flow rate at the outfall of the project site culminating at the El Camino Arroyo. The calculations which appear hereon analyze the existing, allowable and historical conditions for the 100-year, 6-hour rainfall event. The process outlined in the DPM, Section 22.2 was used to quantify the peak flow rates and volumes. As shown by these calculations, the fully developed improvements do result in an increase in runoff generated by the site from 1.7-cfs to 3.5-cfs when compared to historical conditions. The allowable discharge rate was calculated as 2.5-cfs.

The developed subject property increases the existing peak runoff by less than two cubic feet per second as shown on the calculations. A spreadsheet for Precipitation Zone 3 is attached with this plan. This spreadsheet outlines the peak runoff and volume generated for historical, allowable and existing fully developed conditions.

Water Surface Profile – A number of HEC-RAS and FLO-2D models were prepared to assess the extent of flooding potential impacting the project site during the proscribed 100-year rainfall event. As noted above, the peak runoff rate in this area was estimated at 3,304-cfs. The results of the hydrologic models corroborate the northern boundary of the published FEMA floodplain limits.

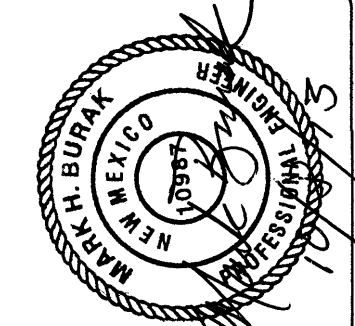
Recommended Improvements - To mitigate potential lateral erosion onto the project site, a four foot deep floodwall is proposed along the eastern property boundary at the wall opening to the northern branch of the El Camino Arroyo. The offsite runoff will drop 1.5-feet over the top of the scour wall as a 16 foot weir opening into a four foot wide concrete catch basin. Four 36-inch diameter CMP culverts will carry the runoff under the driveway and will discharge onto Glendale Avenue in the historical location. The capacity of the culvert battery was calculated at 243-cfs based on the maximum headwater depth associated with the calculated historical water surface at the wall. The calculated capacity of the northern arroyo branch that impacts the wall was estimated at 220-cfs at the same maximum water surface elevation. This water surface elevation is approximately one foot higher than the ridge line between the northern arroyo branch and Glendale Avenue. The ridge line is about 1.5 feet higher than the bottom of the northern branch flowline and 2.5 feet higher than the Glendale flowline. Runoff in excess of the culvert capacity will overtop the perimeter wall and the culvert headwall and will discharge down the existing concrete driveway into Glendale Avenue.

[illegible]

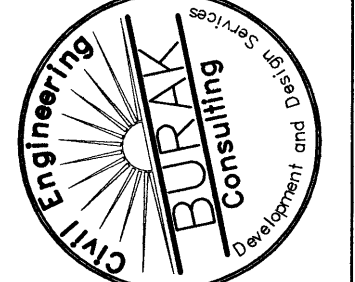
DESIGNED BY: M.H.B.

DRAWN BY: T.D.S.

CHECKED BY:



Mark H. Burak, P.E.
1512 Sagebrush Trail SE
Albuquerque, New Mexico, 87123
(505) 296-0461



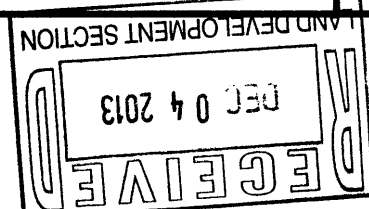
88801 GLENDALE AVE. N.E.

GRADING AND DRAINAGE PLAN

DRAWING NUMBER

C-

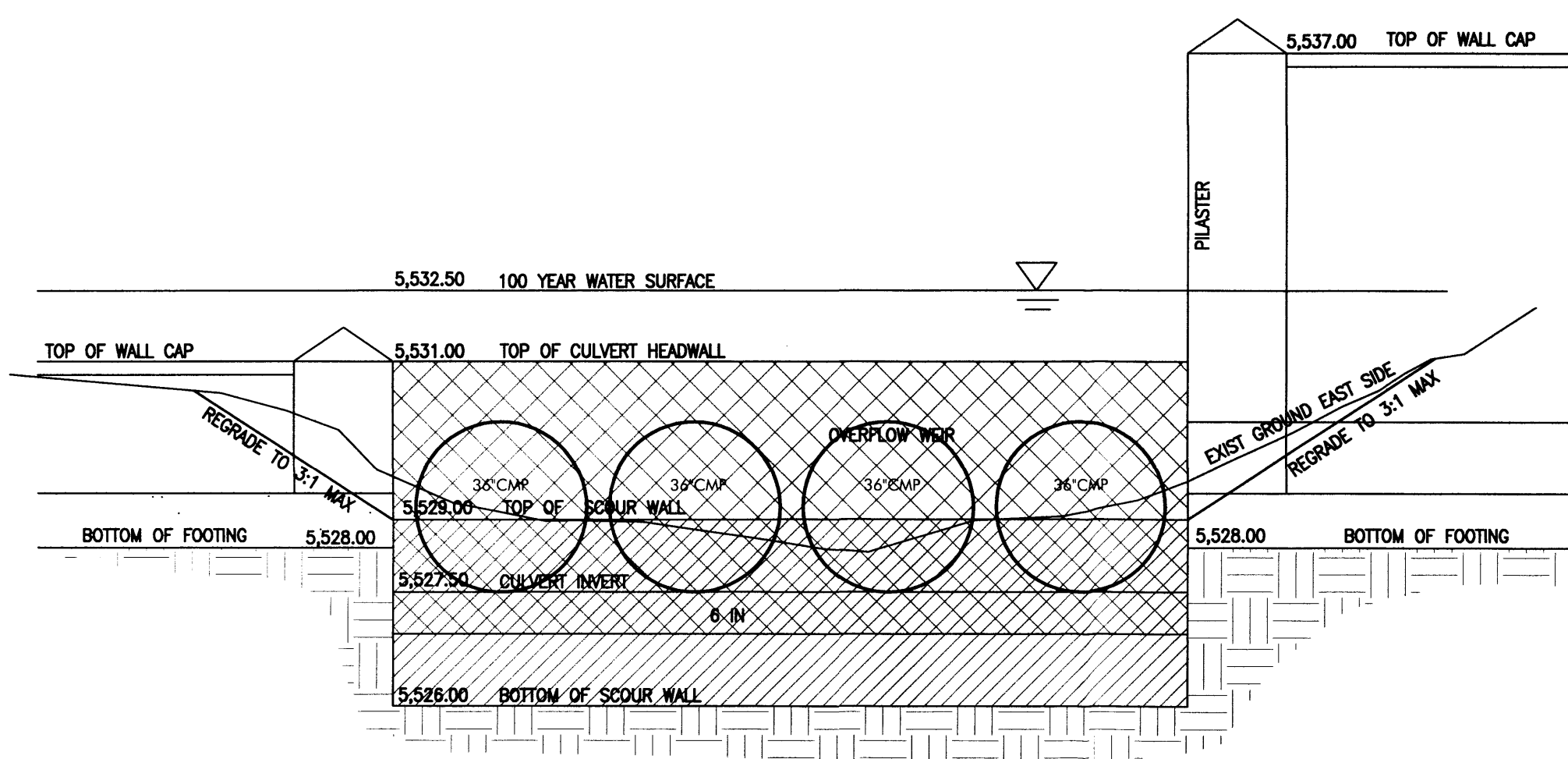
1 OF 2



Hydrologic Calculations - COA DPM 22.2											Gary Padilla Residence 8801 Glendale Ave. September 19, 2013				
Precipitation Zone 3	(inches) P60 P360 P1440 P4days P10days														
Excess Precipitation	(inches)	0.66	0.92	1.29	2.36	0.66 0.92 1.29 2.36					(inches) 0.66 0.92 1.29 2.36				
Peak Discharge	(cfs/acre)	1.87	2.6	3.45	5.02	1.87 2.6 3.45 5.02					(cfs/acre) 1.87 2.6 3.45 5.02				
Drainage Areas	Land Treatments - Historical Conditions					Land Treatments - Allowed Developed Conditions					Land Treatments - Proposed Developed Conditions				
	A	B	C	D	Area (ac)	A	B	C	D	Area (ac)	A	B	C	D	Area (ac)
	0.88	0.00	0.00	0.00	0.88	0.38	0.18	0.18	0.15	0.88	0.11	0.04	0.31	0.42	0.88
Lot 7	100%	0%	0%	0%		43%	20%	20%	17%		12%	5%	35%	48%	
Discharge	Peak FlowRate - Historical Condition: 100 yr					Peak FlowRate - Allowed Developed Conditions: 100 yr					Peak FlowRate - Proposed Conditions: 100 yr				
	A	B	C	D	Q (cfs)	A	B	C	D	Q (cfs)	A	B	C	D	Q (cfs)
	1.65	0.00	0.00	0.00	1.65	0.71	0.46	0.61	0.75	2.52	0.20	0.11	1.06	2.12	3.49
Volume Six Hour	Runoff Volume - Historical Conditions: 100 yr					Runoff Volume - Allowed Developed Conditions: 100 yr					Runoff Volume - Proposed Conditions: 100 yr				
	Six Hour Storm V (cu-ft)					Six Hour Storm V (cu-ft)					Six Hour Storm V (cu-ft)				
	2,108	0	0	0	2,108	907	588	824	1,282	3,600	253	147	1,442	3,619	5,461
Lot 7											Differential 1861 cf				
Volume Ten Day	Runoff Volume - Historical Conditions: 100 yr					Runoff Volume - Allowed Developed Conditions: 100 yr					Runoff Volume - Proposed Conditions: 100 yr				
	Ten Day Storm Event V (cu-ft)					Ten Day Storm Event V (cu-ft)					Ten Day Storm Event V (cu-ft)				
	2,108					4,849					Differential 4138 cf				
Lot 7											8,987				

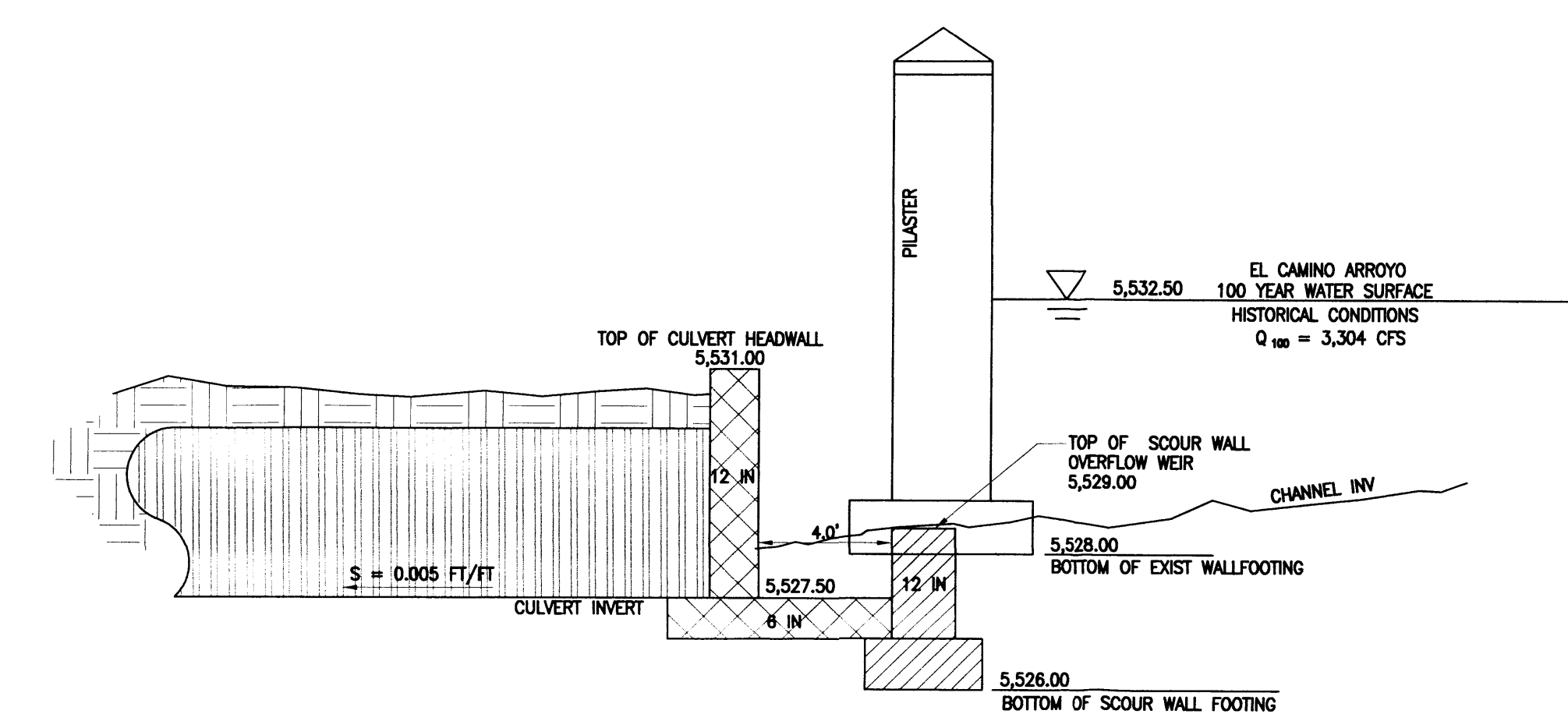
PIPE CULVERT		
Inlet control and outlet control parameters		
8801 Glendale - El Camino Arroyo		
Pipe diameter	36 in	INLET CTRL HWO: beveled edge 4.65 ft
Number of pipes	4	sq edge headwall 5.00 ft
Slope	0.005 ft/ft	thin edged proj 5.90 ft
Manning's n	0.024	OUTLET CTRL HWO: 6.31 ft
Culvert length	80 ft	velocity 8.6 fps
Discharge	243.00 cfs	critical depth 2.48 ft
BURAK		

TRAPEZOIDAL CHANNEL		
Normal depth and critical depth parameters		
El Camino North Branch at Wall		
Input variables:		
Discharge	275 cfs	Normal depth 2.50 ft
Channel slope	0.03000 ft/ft	Normal velocity 10.00 fps
Manning's n	0.035	Froude number 1.34
Bottom width	6 ft	Critical Depth 2.93 ft
Left side slope	2 H:1	EGD Depth 4.05 ft
Right side slope	2 H:1	Scour Depth 2.72 ft
Curve Radius	1000 ft	Superlevation 0.06 ft
		Freeboard 2.34 ft
		Channel Depth 4.90 ft
		Sequent Depth 3.30 ft
Note: Freeboard = (2x0.025(velocity)(depth)^(1/3))		
BURAK		



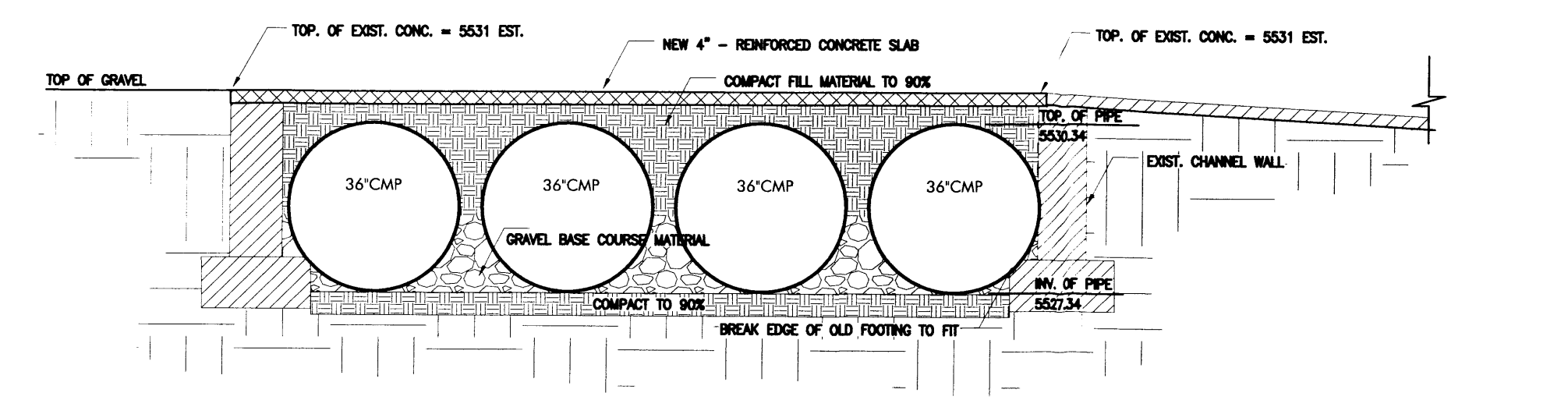
CULVERT INLET DETAIL

NTS



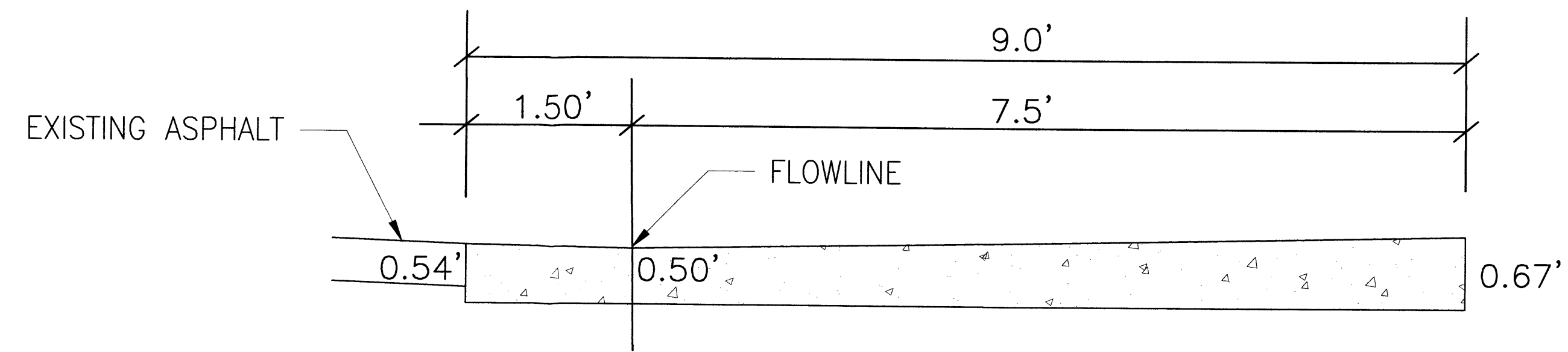
CULVERT INLET DETAIL

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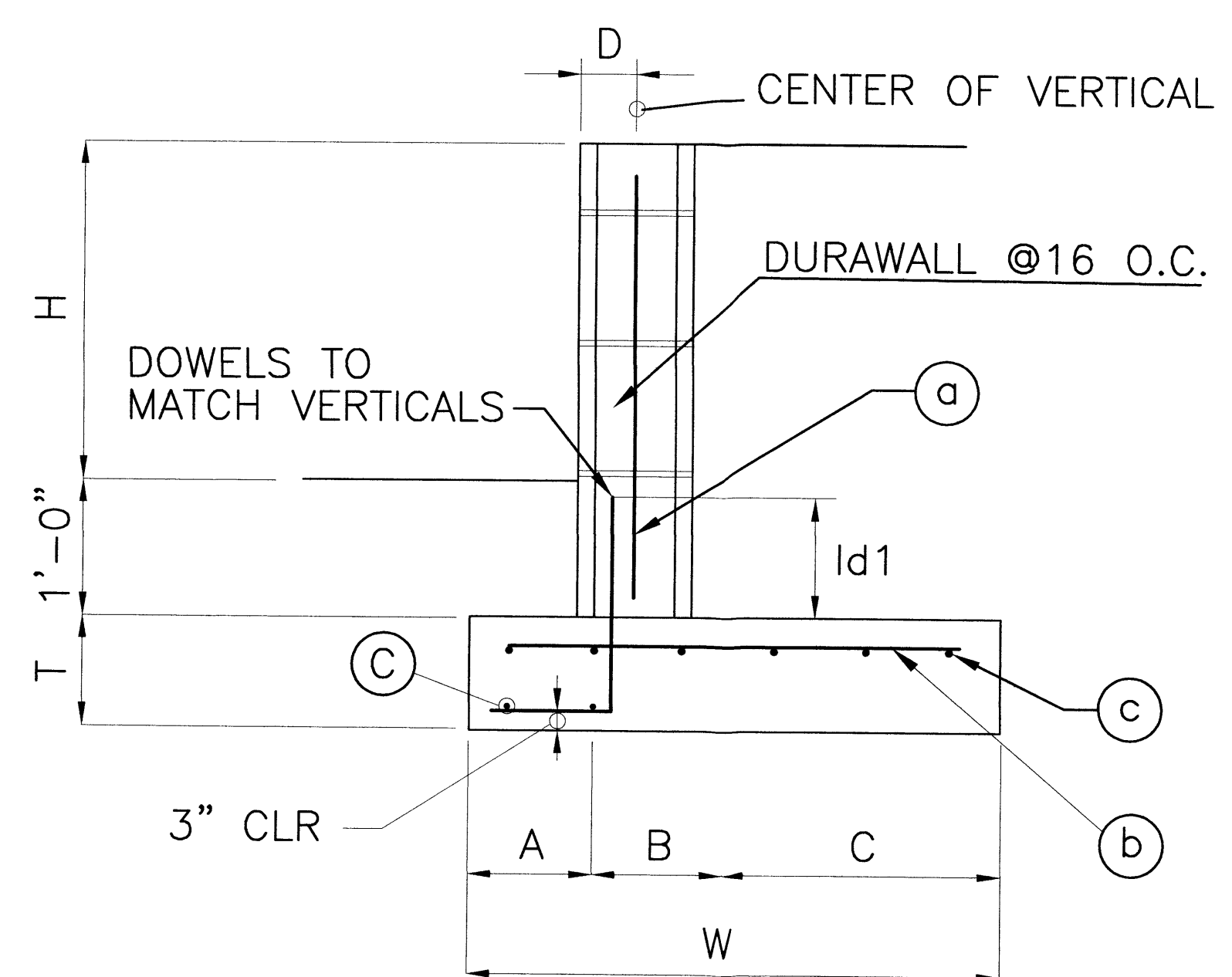
DRIVEWAY CULVERT SECTION B-B

NTS



SECTION A-A

N.T.S.



TYPICAL RETAINING WALL OVER 18"

RETAINING WALL DIMENSIONS & REINFORCEMENT											
MIN. DIMENSIONS							STEEL REINFORCEMENT				
H	T	A	B	C	D	W	a	b	c	ld1	
2'	1'-0"	0'-6"	0'-8"	0'-10"	5 1/4"	2'-0"	#5@24" o.c.	#5@16"	#4@16"	1'-6"	
3'	1'-0"	0'-6"	0'-8"	1'-3"	5 1/4"	2'-5"	#5@16" o.c.	#5@16"	#4@16"	1'-6"	
4'	1'-0"	1'-0"	0'-8"	1'-2"	6 1/4"	2'-10"	#5@16" o.c.	#5@16"	#4@16"	1'-6"	
5'	1'-0"	1'-0"	0'-8"	1'-9"	6 1/4"	3'-5"	#5@8" o.c.	#5@16"	#4@16"	1'-6"	
6'	1'-0"	1'-0"	0'-8"	2'-6"	6 1/4"	4'-2"	#5@8" o.c.	#5@16"	#4@16"	1'-6"	

RECEIVED
DEC 04 2013
LAND DEVELOPMENT SECTION

DESIGNED BY: M.H.B.
DRAWN BY: T.D.S.
CHECKED BY:

8801 GLENDALE AVE. N.E.
CALCULATIONS AND DETAILS
C2
2 OF 2

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Engineering
BURAK
Consulting

REVISION
BY
DATE
MARK